THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—21ST YEAR. SYDNEY, SATURDAY, JUNE 9, 1934. No. 23.

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The Beattie-Smith Lectures.[1]

(UNIVERSITY OF MELBOURNE.)

By OLIVER LATHAM, M.B., Ch.M. (Sydney),
Pathologist to the Mental Hospitals Department, New South Wales.

LECTURE I.

SOME ACTIVITIES OF A MENTAL HOSPITAL LABORATORY DURING THIRTY YEARS.

PSYCHIATRY in Australia is fortunate in having allotted to its interests the Beattie-Smith foundation lectures. These lectures annually remind the medical world both of the importance of psychiatry and of its most recent advances. This is usually achieved by enlisting the services of Australia's leading psychiatrists and neurologists. However, when this group nears exhaustion, recourse is sometimes had to the neuro-pathologist, something of the nature of whose work the following lectures will indicate.

It scarcely needed the exigencies of the late War to reveal to the world the ubiquitous accomplishments of many of my *confrères*. Mott was as able a physician as a neuro-pathologist. Orr and Rows quitted their respective mental hospital laboratories and acquitted themselves ably as medical superintendents of military hospitals interested in war neuroses. Otto Folin achieved the conquest of new kingdoms in the realms of micro-biochemistry. My predecessor achieved notable success in the Australian Imperial Forces hospital administration overseas. Finally, the three Victorian pathologists who have preceded me refused to be bound by the dictates of pure pathology, but sought to carry out Beattie-Smith's ideals by presenting many new ideas, both as regards the prevention and clinical treatment of mental and nervous diseases, not overlooking the broader aspect of mental hygiene and aftercare.[1] [2]

Not feeling myself an Admirable Crichton, I am constrained to confine my remarks and my pictures

[1] Delivered December 5, 7 and 8, 1933.

to neuro-pathology and, where I can, to its handmaid that of diseased mental states, gratefully remembering the dictum of Branham and McGraw that neurology cannot be held as divorced from psychiatry.[3]

This choice is perhaps the better justified on account of the widespread use of malarial therapy; the apparently increased incidence of that pathological condition known as encephalomyelitis; *encephalitis lethargica* itself; a better understanding of brain reactions in acute diseases generally; head injuries; odd outbreaks of rabies due to bat bites; the diagnosis of Hodgkin's disease by encephalitic reactions in animals; various claims put forth for the serum treatment of anterior poliomyelitis, and therefore the necessity for its earlier diagnosis; the use of numerous colloidal reactions and precipitin tests in the fluids and sera of cerebral lues for its earlier recognition; and lastly the rise of the "team" idea since the War and its application to our branch in the form of neurological clinics, where with the psychiatrist, neurologist, psychologist and almoner, the neuro-pathologist finds his place, accompanied by a biochemist. To such an extent has specialization progressed. One has also to bear in mind the rise in New South Wales of out-patient departments, both in city and country, for the treatment of early mental states, all demanding any help serology can give.

The creation of the chair of psychiatry and the inauguration of the post-graduate course in this subject took place nearly ten years ago. The completion of a special block in the grounds of the Royal Prince Alfred Hospital (for which a sum of money has long since been privately provided) where patients, the subject of early mental disorders, might get residential treatment, would provide students in medicine, graduates and undergraduates with the necessary facilities for the fuller understanding of the problems of nervous and mental diseases. It has, of course, long been recognized that casual visits to distant mental hospitals provide quite a distorted view of the mind in disease. Most of you are aware of the almost unsurmountable difficulty of providing adequate teaching matter in neurology in the absence of some central follow-up station to keep in touch with the discharged patient. The creation of the magnificent Rockefeller School of Clinical Medicine in Sydney has given a fillip to neurological surgery, and has resulted in the increased application of surgical and medical measures to intracranial and spinal conditions. Among these must be mentioned tumours of the nervous system. Now these vary in their behaviour, some being more sensitive to X rays, others to radium, while others still, being relatively benign and slow growing, merit greater efforts at their extraction. The pathology of these states therefore becomes increasingly important, and we have to build up our own experience, grateful as we are to the older American and British schools of neurological surgery. Up to the present the laboratory of the New South Wales mental hospitals has supplied quite an appreciable amount of work to these clinics and to those neurological enthusiasts who had interesting clinical cases to publish, but not the wherewithal to complete the pathological side. By this work the laboratory enriched itself with the priceless experience of meeting these specialists, as well as providing material otherwise unavailable for its museum and students. A glance over the published works from the laboratory or, better still, a cursory glance over its numerous boxes of slides from cases of nervous disease, would show how much material would have gone to waste but for our activities in this line of thought.

Factors in the Creation of the New South Wales Hospital Laboratory.

At quite an early period of our late Inspector-General's career, he felt psychiatry would never come into its own until it had, besides the teaching of psychiatry to medical students, its own professor, with his appropriately appointed clinic, including out-patient department, pathological laboratory, and even beds, and these not only in general hospitals in the metropolis, but throughout the country in the larger country hospitals. The course in psychological medicine was not only to raise the standard of knowledge among his own medical officers, but also (and this he stressed) to create an interest in the efficient treatment of early mental cases by the general practitioner.

Not being able to get all, he had to be contented with a laboratory and pathologist. The creation of Broughton Hall for psychasthenic soldiers ultimately gave him a hospital for uncertified mental patients, and his energy and ideals being shared by his successor, Dr. C. A. Hogg, we must congratulate the latter in getting within sight of the fulfilment of nearly all these ambitions.

James Froude Flashman, having early displayed an interest in pathology, and from his friendship with Professor J. T. Wilson and with Grafton Eliot Smith in comparative anatomy and anthropology also, naturally became our first pathologist. These friends prevailed on Sir Thomas Anderson Stuart to provide rooms in the medical school which we still occupy. It seems fitting here to acknowledge our great debt of gratitude to the University for these privileges. They not only allow us a central position, easy of access to the many departments and activities within the University, but also are of great convenience to the post-graduate students taking the diploma in psychiatry course, who make these rooms their headquarters and meeting place. In course of time work of such varied nature was demanded of us that without access to special departments we should have been seriously inconvenienced. Professor Henry Priestley, Professor H. G. Chapman and Dr. Wardlaw in physiology, and Professor T. J. Hunter and Professor A. G. Burkitt in anatomy have constantly aided us. We have also been in close association with Professor D. A. Welsh, whose ripe pathological experiences are always at our elbow. Later on we were very pleased to be able to draw on the resources of the Bureau of Microbiology and the School of Public Health and Tropical Medicine. Nor must there be omitted numerous consultations with pathologists from the metropolitan hospitals, who, like Dr. W. K. Inglis and Dr. A. H. Tebbutt and their *confrères*, have run across specimens in the

field of neurology in their routine work, specimens which have merited more than ordinary interest and examination. It is difficult to see how all this could have been achieved had we been located where our mental hospitals are situated.

EARLY WORK IN THE LABORATORY.

As the laboratory was the first of its kind in Australia there were few precedents for the work to be undertaken, and naturally the influences of Wilson and Elliot Smith directed attention towards the anatomical method of approach. In due course, however, a government grant enabled Flashman to visit the neurological laboratories of England, Scotland, France, Belgium, Germany, Austria and Italy, where he met Wassermann, Mott, Ford Robertson and many others. Thus he was able to return with the necessary technique, instruments and reagents to start his assistants cutting celloidin Pal-Weigert and Held serial sections of the whole brain and brain stem of both mental patients, Australian aborigines and native animals. Some of these sets were used by both Wilson and Elliot Smith in the preparation of their well-known monographs. One result has been that the laboratory has a fine collection of Australian aboriginal brains and skulls on which visiting anatomists can work and make comparisons, as was recently done by Shellshear from Hong-Kong. Shellshear found a smaller percentage of those peculiar features supposed to be the prerogative of our natives in the occipital region than he had found among one stratum of his Chinese coolies.

Flashman also destroyed specific areas in the brains of our primitive animals, and in due course killed and prepared Marchi-Busch sections, wherewith, if possible, to throw light on similar tracts in man. The technique of his laboratory assistants, Mr. Wood and Mr. Hedger, appears to me to have been of the highest order, for most of the work remains as good today as when it was done some thirty years ago. It is interesting to record that Professor Burkitt is providing opportunities for his assistant to prepare similar sections of many Australian marsupials *et cetera* in order to have a library, as it were, of this material. It is also our aim to create a library in which one may find examples, museum and histological, of neurological pathology as it obtains in Australia.

Flashman's results were published in our Reports, and include "A Preliminary Note on the Cerebral Cortex of Marsupials", "The Morphology of the Brain of the Australian Aboriginal", "Degenerations Following the Resection of the Olfactory Lobe in Dasyurus Viverrimus", "Description of the Sulci of Four Brains of Australian Aboriginals", "The Evolution of the Parieto-Occipital Fissure as Illustrated in Some Aboriginal Brains", and later "The Relation of Brain to Skull: with a Special Reference to the Australian Aboriginal".

Coming to work more nearly connected with pathology, Flashman published "External Features of the Brain of a Microcephalic Idiot, Showing Absence of Corpus Callosum", "Acute Dysentery in Sydney", "The Effects of Salvarsan on Syphilitic Nervous Disease", "The Wassermann Reaction as Applied to Syphilis and General Paralysis", and finally "The Question of Research in Mental Disease".[4] [6] [5] He also described a case of diphtheroid meningitis treated by vaccine. With Colonel A. G. Butler he performed probably the first Bordet-Wassermann tests in Australia, and I well remember with what emotion he received a packet of "606", also the first in Australia, from Wassermann himself and exhibited it to one of Dr. McMurray's patients in Sydney Hospital.

Together we published articles dealing with syphilitic manifestations including the Wassermann reaction among certified idiots, the pathology of general paralysis, with special reference to the action of diphtheroid organisms, heterotopia of the spinal cord,[7] [8] disseminated sclerosis. Finally, we initiated an inquiry into a typhoid outbreak at Stockton mental hospital, and started anti-typhoid preventive inoculation. After the practice had been taken up by our other mental hospitals, the incidence of typhoid fever among patients and staff decreased from 207 during the period 1900–1914, inclusive, to 12 (or two if only the inoculated are considered) during the period 1915–1924, inclusive. We must be careful to add, however, that there was a State-wide diminution of typhoid *pari passu* with the introduction of water-borne sewerage, which was also gradually introduced to our hospitals. Later on several carriers were detected and isolated. These results Dr. Hogg and I published in *The Lancet* of August 21, 1926.

On the same lines mental patients and attendants at the dairy were examined with a view to note the presence of abortus fever. Fifty-four patients and staff gave negative results to the agglutinin test, and the milk of thirty-two cows was injected into guinea-pigs. Two cows gave positive findings for Bang's abortus bacillus and were dealt with.

LATER TRENDS IN LABORATORY WORK.

Since my predecessor's retirement the work has developed more on the biochemical and histological side. Thus Dr. Quaife made improvements in Golgi's technique; several papers were contributed on cerebro-spinal fluids and on sera from epileptics, primary dements and syphilitics respectively. Mott's work on the ductless glands in primary dementia appeared about this time, and stimulated interest in this subject; the laboratory then prepared some eighty sets of ductless glands, chiefly from epileptics, to aid the researches of Dr. Prior, Dr. Jones, and Dr. Nowland. Further work on sera and fluids was done in connexion with their attempts to treat general paralytics by introducing medicated fluids intrathecally, by "Salvarsan" treatments and by malaria, and quite lately by diathermy. I did some work in connexion with test meals in the insane which revealed quite interesting findings, and this was followed up lately by Dr. J. Bostock. Considerable difficulty was experienced in obtaining a pure simple tertian strain of malaria for our paretics and several samples that I personally rejected were passed as pure by pathologists and physicians who had had extensive experience in Palestine with the Australian Imperial Forces.[9]

Experiences Abroad.

When I was working in Ford Robertson's laboratory in Edinburgh, he assured me that I would be dissatisfied with paraffin sections of the central nervous system, and held that I should rely on frozen sections and celloidin.

Weil has recently emphasized how different a usual Nissl preparation is compared with the inventor's technique; nevertheless, by using the cedar wood oil-ligroin (reinforced with celloidin when necessary)-paraffin method, quite useful pictures are obtained.

A personal acquaintance with Dr. Orr and Dr. Rows[10] stimulated my interest in their views on the lymphogenous and hæmatogenous paths of infection in the central nervous system—ideas finding important places in present day text-books. Similarly, a chance visit to Gordon Holmes at Queen's Square enhanced my interest in compression myelitis, especially when occasioned by slight trauma. McWeeney, in Dublin, and Mott, in London, initiated me into their several specialties. The former demonstrated the various methods of using iron hæmatoxylin, and the latter applied Hortega's methods for the interstitial tissues of his ductless glands.

Lines on which the Work will be Presented.

It is proposed to indicate some pathological ideas and methods that I have found specially useful, and the sources of others. Then I propose to present the pathology of the more interesting types of mental and nervous diseases, in the order presented by some standard work on neurological pathology, such as that of Buzzard and Greenfield.[11] This might at the same time give some indication of the frequency and types of such states in Australia during thirty years. It will be necessary to use some diagrams from special monographs to make my meaning clearer or to fill in gaps in some series; otherwise the slides presented are microphotographs of work done in or presented to the laboratory. These preparations and methods are not only on view to university graduates and students, but have been made available from time to time to many pathologists and technical laboratory assistants from our own and other States. In order to excite more interest, clinical details will be added where necessary or possible.[1]

Tumours of the Nervous System.

The greater interest taken in intracranial tumours in the last few years and greater boldness and success in treating them have led to a demand for their better classification. Naturally, this new interest is reflected in teaching and it devolved on this laboratory to devise the means of certain investigations until other laboratories had had time to be organized. Never techniques and investigations[12] demanded a newer outlook on many tumours received in the last thirty years, and the opportunity was taken of going over these; restaining was carried out where possible. With few exceptions it was found possible to reclassify these after the order of Bailey and Cushing.[13] Several, for instance, labelled sarcoma may now be considered medulloblastoma, but whether a heading for nerve or glia tumours should be included cannot be stated. A simple scheme will be presented to render my further statements more clear, my object merely being to present types of work as they seem to fill positions in these new schemes, and not to write an article on tumours.

Tumours will be considered thus: (*a*) Vascular tumours, (*b*) membrane tumours, (*c*) microglia, all non-nervous. Tumours of nervous tissue will be considered as derived from the cells representing certain stages in the ascent of cells from the primitive neural crest to the adult cell, or reversions to such a stage. In the simplest plan four different lines of descent may be recognized: (i) those going to form nerve cells, (ii) those going to form glia, (iii) those going to form lining cells for the ventricles, central canal or covering chorioid, that is, ependymal, and (iv) the oligodendroglia. Seldom can tumours be found presenting all the cells of exactly one stage of development, and the primitive cell is so undifferentiated that we cannot tell whether it is destined to produce nerve cells or glia, just as we cannot tell offhand whether a sarcoma cell would become, if differentiated, a fibre or an osteoclast. Thus tumours composed of bi-potential cells may include both nerve and glia cells. A table will be presented (Table I) showing the percentage of all the tumours both from our laboratory and from Professor Dew's clinic that we have examined. Included in the table are percentages of types of tumours found in Bailey and Cushing's series of 246.[13] Numbers in brackets are our figures corrected to meet his way of reckoning, for he excludes all non-nervous tumours, and also those from the spinal cord and peripheral nerves.

Vascular Tumours.

Vascular tumours,[15] whether composed of fairly differentiated cells such as the angiomata or embryonic cells when they were called sarcomata or endotheliomata, are well known in the body, but their importance in the nervous system has not so long been recognized. The embryonic type, called angioblastoma, presents cells which readily resemble meningioblasts, and even glial cells. The meshes often include so-called pseudoxanthomatous cells as in one we had. (Figure I.) The innocent tumours are common on the cord, from which they can be readily removed. Some collections of large veins, however, on either cord or brain communicate with large similar structures deeper in, and defy both tying and removing. (Figure II.) Sometimes repeated operations cause a regression to a lower type of cell, and thus complete removal is further complicated.[16] We have examples of these types in the cord, an example of a cavernous angioma of the frontal lobe associated with sudden death and sixteen angioblastomata from various situations. (Figure III.) They seem a favourite tumour about the *cauda equina*,[17] and may resemble angio-endothelioma, of which we have a specimen successfully removed from a patient in Newcastle, reported in THE MEDICAL JOURNAL OF AUSTRALIA, December 11, 1920. (Figure IV.)

[1] In order to utilize to the best advantage the space allowed for illustrations only our own work is published, and a slight alteration is made in the order taken. Actually some 140 lantern slides were exhibited to illustrate the Lectures.

FIGURE I.
Angioblastoma—pseudoxanthomatous cells with small nuclei. × 200.

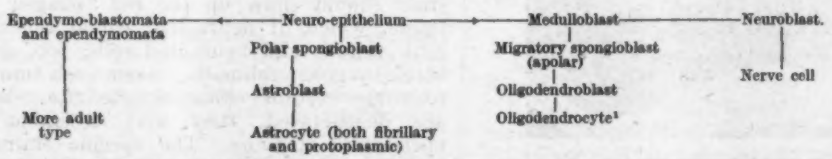
FIGURE II.
Obvious angiomatous tumour of cervical cord, yet without doubt it has degenerated within the cord into an angioblastoma. × 3.

TABLE I.

Table of Tumours, with Corrected and Total Percentage Classification.

Group.	Laboratory.	Dew's Clinic.	Total.	Percentage on 172.	Corrected Percentage on 95 to Match.	Bailey and Cushing's Percentage on 246.
Meningiomata, blastomata	12	4	16	9		
Angiomata and angio-blastomata	14	4	18	10		
Microglia	0	0	0	0		
Schwannomata	10	3	13	7		
von Recklinghausen's Tumour	2	0	2	0·5		
Oligodendroglia	1	1	1	—		4
Medulloblastomata	7	1	8	5	8	12
Bipolar spongioblasts	8	1	9	5	36	31
Glioblastoma multiforms	24	5	29	22		
Astroblastomata	6	1	7	4	7	5
Astrocytes, both types (fibrillary and protoplasmic)	25	7	32	18	30	38
Ependymomata, Ependymo-blastomata and chorioidal papillomata	5	0	5	3	5·5	5
Neuroblastomata and ganglio-neuroblastomata	15	1	16	9	2	2
Secondary invasions	10	0	10	6	—	—
Pituitary adenomata	2	0	2			
Tumours (?) behind eye	2	0	2			

Simple Classification from Penfield.[(93)]



Pathological forms of the adult astrocyte are given as (*a*) piloid or fibrillary or hairy, excess of fibres; (*b*) Nissl's plump astrocyte, the ordinary astrocyte revealing but little cell body; and (*c*) giant astrocyte with innumerable fibres, and can of course arise in reactionary tissue.

[1] The French school[(34)] considers the Schwann cell a peripheral oligodendroglia and subject to any change and tumour potentialities as the neuro-epithelium might possess; not all accept this view.

FIGURE III.

Cavernous angioma of the frontal region. Large blood-filled spaces lined by definite endothelium. × 75.

FIGURE IV.

Angioblastoma or angioendothelioma of lower end of cord; operation specimen. Death after two years from trophic ulcers. × 75. (*Note*: According to some, an ependymoma; colloid material in spaces.)

Meningiomata.

Meningiomata[18] [19] have long been known, and we have examples of most sorts. Their malignancy depends on their reverting to highly undifferentiated cellular types, but even differentiated types can infiltrate widely, as in the so-called cylindroma. Some reproduce tissue almost the replica of dura, and readily lend themselves to removal as they lie on the cortex. One that I received last week, includes besides bands of fibrous tissue, spindle-shaped cells like Schwann cells which infiltrated the whole temporal lobe. Other types resemble pial tissue, and many kinds can form cysts which at *post mortem* examination may get detached and appear free. Some produce abundance of calcium deposit and whorls of hyaline spheres. Some multiply the endothelial cell element so well described by Ford Robertson, and can reproduce hyaline cells visible to the naked eye floating in the cyst fluid. Types of all these have come our way. (Figure V.) Staining by Van Gieson

FIGURE V.

Ependymoblastoma? Note individual cells becoming free and hyaline have enormously swollen to be seen by naked eye. Hyaline tumour masses were present deep in cortex. × 125.

stain should show up the red collagen or fibrous tissue, which, if neuroglial, would remain a dirty pink yellow, and neuroglial cells, too, would stain black by gold sublimate. Some such tumours much resemble certain chiasmal gliomata. When they are degenerated, they may resemble types of ependymal tumours. The specific stains and the presence of blepharoplasten in glial tumour cells help in differentiation.

Some peculiar tumours take on the specific stains of the microglia.[12] The differentiation of these

tumours has been possible only since the advent of the splendid researches of Del Hortega, who has modified many methods, including those of Achucarro, to reveal the unexpected richness of the processes both of the oligodendroglia[20] and the microglia, and to trace out in an unmistakeably clear manner the origin of the latter from the mesoblastic cells from the pial regions. Granting that Golgi marked down a cell which he called the "third element", credit is usually given to Ford Robertson[21] for first displaying the oligodendroglia. As a pupil of his, I think I can bring evidence to show he displayed and described both, but quite mixed them up. He talked about a mesoglial element which alone took the stain on properly by his platinum method, and which remained save for the nucleus unstained by methods which stained the other elements. A reference to his text-book from page 170 to page 188, and to his Plate XX, Figures XX to XXVII, will show in short that he drew different cells, which, one or other, included both oligodendroglia and microglia. His description of the functions and actions of these obviously are those of both of them. He writes:

> I contend these special elements are different not only structurally and functionally but also in origin . . . being derived from the mesoblast.

Admitting Golgi's priority, he proceeds:

> They occur widely, their processes are the same substance as the cell body and markedly dendritic. Extending from the cell body in various directions are three to six delicate processes which branch dichotomously . . . they are often close to nerve cells and extend processes beside it and some cells are only slightly branched.

This surely refers to the oligodendroglia. Now for the modern mesoglia cell characteristics:

> Their functions differ from the epiblastic neuroglia . . . they do not repair . . . behave like endothelial cells, *i.e.*, as phagocytes but do not form fibrils. When irritated, these cells lose their branching character and become small granular cells behaving as phagocytes like the other leucocytes. Morbid changes in these mesoglial cells resemble those taking place in the dural and pial endothelial cell. They become associated with local destructive processes in nervous tissue, and can give rise to amyloid bodies.

He maintains (as does Weil) that amyloid bodies originate from several sources, and that they come from the pia. The cells that he showed me how to stain certainly resembled the oligodendroglia.

We have no example of microglial tumour, and one doubtful oligodendroglia. The latter must of course be included with the epiblastic neuroglia. About ten instances of secondary tumours in the brain and one in the cord have been noted by us, including the very last to hand. This is an extraordinary specimen from a woman who had been demented some months. (Figure VI.)

> The brain contained eight cysts up to five centimetres wide in the cerebrum and several in the cerebellum, lined by a sort of frosted or foamy altered brain substance and without visible reaction, naked eye or microscopic, in the surrounding brain tissues. Several skilled observers mistook them for hydatid cysts or abscesses, but they were lined by a typical carcinomatous membrane, no doubt secondary to a breast removed six years previously.

Hassin and Singer,[22] discussing cerebral carcinomata, speak of a transition zone, or a demarcation zone, the latter being rare. Obviously ours is an example of the latter. Some of the cysts contained a grumous fluid holding swollen cells, and others contained solid hyaline material.

Epiblastic Tumours.

The most undifferentiated types of epiblastic tumours, including bi-potential medulloblastomata and neuro-epitheliomata, I shall leave, and take them with the nerve cell tumours. We can therefore start with those gliomata with cells with some shape and form besides nuclei. Since they proceed to develop tails more or less in evidence, we may first take the bi-polar spongioblast or glioblast. Carefully noting their appearance when viewed microscopically in their longest axis, we shall see that the elongated cell body seems to run into bodies of other cells and to lead to difficulty in picking out a separate cell. The body process varies from just on oat shape

FIGURE VI.
Carcinoma (secondary) in brain, showing "demarcation zone" as well as cyst formation. × 10.

to a remarkable cell stretching right across the low-power field.[23] (Figure VII.) They infiltrate badly and grow fast, except this extremely large type. Stained by gold sublimate or silver carbonate the cell is readily noted.

Glioblastoma Multiforme.

The cells of *glioblastoma multiforme* belong to the same generation, shall we say, as the last. However, it is held that it can arise by regression from a protoplasmic astrocyte. They are common, and the numerous and large nuclei and cells are characteristic. They grow quickly and infiltrate.

Among interesting tumours of this type may be mentioned one which occupied an area closely

corresponding with the lower part of the area of normal aphasia as figured by Head in his Figures Number X and Number XI.

The tumour appeared to undermine an area from the anterior part of the lateral surface of the left occipital lobe, anterior to the *sulcus lunatus* and including the posterior end of the inferior and middle temporal gyri, but not extending upwards into the angular or post-parietal gyri. Ventrally it extends or lies deep to a considerable part of the fusiform and inferior temporal gyri. The eye specialist did his work well. He reported:

> A month previously the man had been treated for some complaint regarding spectacles and on reexamination the glasses were correct, but the patient complained of them. I now found he could see letters, but not name them. He would draw them all right, but not name them. Words were the same. With prompting he would spell a word slowly and not name it. A pen was a pencil, but he knew that was wrong, and expressed pleasure when I correctly named it. A corkscrew was a "screw for pulling corks". I diagnosed partial word deafness and blindness. He is an engineer on a vehicular ferry, and has to read telephone messages from the bridge. I am wondering is he safe for the job!

FIGURE VII.

Bipolar glioblast. The gold sublimate method brings out the sheafs of long fibres, not otherwise readily noted. × 125.

Unipolar Glioblasts.

A further stage brings us to unipolar glioblasts. They may develop a tangled skein of tails, and thus appear to have processes, grow slowly, can look like neurinomata, so that they are closely approaching in development the astroblasts.

Astroblastomata.

The astroblastomata form a very characteristic group wherein the cells by now have definitely arranged themselves so that one very thick process or part of cell body coalesces with the adventitial coat of the vascular system forming the pia-glial or meso-ectodermal membrane. Other rather coarse fibres are present. These now reach their highest development by becoming either fibrous or protoplasmic astrocytes. Schools are divided as to whether the latter is not a reversion of the former, but for the present tumours are called specifically after each. Formerly only tumours composed of these cells were recognized as gliomata for certainty. These tumours, while composed of the highest differentiated cells, infiltrate in a peculiar but dangerous manner, especially the giant variety, one of which we described.[24] Except where the cells are thickest, very little necrosis occurs among the neurones, hence enormous hypertrophy can take place in a lobe leading to the term megaloncephaly *et cetera*. (Figure VIII.)

Commonly, the invaded part or lobe hypertrophies evenly, and on naked eye examination one notes on cross section an increase of white matter. Thus we have two examples of a hypertrophied pons, two in which one cerebral hemisphere seems twice the other in bulk, and one in which the treble size of the hypocampus troubled me till sections revealed astrocytes, invading widely, and yet in no apparent way destroying the crowded neurones. (Figure VIII.)

FIGURE VIII.

Astrocytoma (fibrillary), gold sublimate stain. Note neurones not damaged. Almost whole temporal lobe "hypertrophied". × 250.

Two of these were examples of giant cell astrocytes, and recently there have been described two tumours of similar cell types invading both cerebral hemispheres.[25] One astrocytoma (Figure IX) has taken the form of a solid lump of meat overlying the lateral rolandic area like a cap, or more resembling a massive hæmorrhage into an old subdural false membrane. It measured 12·5 by 7·5 by 5·0 centimetres (five by three by two inches). Astrocytomata thus may

be composed of cells varying in form and size to a remarkable degree. Some are so minute that, save by special staining, only the minute dots of the nuclei are visible. Many assume an elongated form, and are said to "stream" away in parallel rows. Certain gliomata of the bipolar and unipolar series thus so resemble Schwannomata of nerves that they have been called "central neurinoma". An example may be given.

FIGURE IX.
Huge astrocytoma emerging from deep cortex and forming a fleshy cap over parietal region, not unlike *pachymeningitis hæmorrhagica*. It also infiltrated. Half natural size.

This tumour occurred in a little girl. The tumour cells (astrocytes) tended to seed along the pia-arachnoid of the whole nervous system. In the cortex, standing erect like the organs of Corti in the ear, they lifted the pia from the brain. (Figure X.) They streamed down the substance of the stem and finally infiltrated both pia and substance of the cord.[10]

Medulloblastomata are supposed to do this, and are common in the cerebellum, but a recent tumour on the cerebellum, but sharply defined from it, proved to be a protoplasmic type of astrocyte. One can imagine the surgeon's difficulties in these types. Yet in the cerebellum astrocytomata commonly degenerate into cysts. Relief comes with decompression, but to effect a cure one must remove the growing point or nodule, when the prognosis is excellent.

Gliomata can occur both in the olfactory and optic lobes, and the latter chiasmal astrocytomata present curious features. The cells resemble those of the meningioblastomata, and disconcerting fibrous-like septa develop. Here again specific stains make the chief way out, as I can testify. Any sort of a tumour which causes pressure about the pituitary and chiasma, ultimately leads to signs which are remarkably diagnostic as far as ability to localize the tumour is concerned.

Kennedy's Syndrome.

Patients with Kennedy's syndrome are between forty and sixty. Inasmuch as the (primarily) unilateral tumour presses on the olfactory tract of one side, or involves it, the first symptom will be nasal irritation, for which the patient will be operated on by some throat or nose specialist. Then will come anosmia, which will be readily missed or which will be put down to the nasal operations. The anosmia will be unilateral. Pressure on one optic tract will cause optic atrophy, but not papillœdema, since the growth prevents fluid under pressure proceeding along the optic stalk. Slowly progressing mental dullness occurs. Then bilateral anosmia appears; then papillœdema of the opposite side, because the increased intracranial pressure can (at some period) proceed down that optic stalk. At any period after the initial onset, other signs of intracranial tension may occur—headache, fits *et cetera*.

FIGURE X.
Long-celled astrocytoma (some cell groups are more anaplastic). It is spreading from cortex to cord by both pia and brain stem. It infiltrates the brain stem like a central neurinoma. × 56.

Of course, one may have superadded damage to the infundibulum or supra-pituitary region and *diabetes insipidus* and genital anomalies. This eventuated in a case that we published,[9] the illustrations of which in a remarkable degree resemble three cases of Gordon Holmes, who set out to suggest that inasmuch as the pituitary (as in ours) remains unaffected, these syndromes must attach to the supra-pituitary region.

Perhaps mention may be made here of two pituitary tumours examined, one composed of small cells like a perithelioma—chromophobe cells, and the other of the larger and granular chromophyle cells.

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TREATMENT OF SUPPURATION IN BONES AND JOINTS.[1]

By A. V. MEEHAN, M.B., F.R.C.S. (Edinburgh), F.R.A.C.S.,

Honorary Orthopædic Surgeon, Mater Misericordiæ Children's Hospital, Brisbane; Honorary Consulting Orthopædic Surgeon, Hospital for Sick Children, Brisbane.

I PROPOSE to take full advantage of the opportunity of addressing you tonight to do a piece of special pleading against the evil of over-treatment, which daily experience proves beyond dispute to exist amongst us in the management of suppurative conditions of the bones and joints.

It is to be understood that I am not bringing the treatment of compound fractures within the scope of this paper, but am confining it to hæmatogenous infections.

The principles of treatment that I would stress in the case of the bones are adequate drainage and rest. These principles can be applied to all the bones, as all bones are similar in structure and function. In joints, great variation in structure exists, and while the principle of rest applies to all, the use of drainage must be modified in relation to individual joints.

[1] Read at a meeting of the Queensland Branch of the British Medical Association on April 6, 1934.

As part of the application of the principle of rest to both bones and joints it is of great importance that dressings should not be changed frequently. We are all familiar with the dreadful picture of the child, who has had a bone drained for osteomyelitis, being subjected to daily or even more frequent changes of dressing. His screams are a nightmare to all concerned; he rapidly becomes a nervous wreck; and yet his toxæmia fails to respond to this well-intentioned, but cruel, activity of treatment. Too often in fact his maximum daily rise of temperature occurs soon after each dressing. His wound is robbed of all chance of healing, for as fast as Nature attacks the difficult problem of healing a bone cavity by throwing out a few feeble granulations, the sacrilegious hand of the surgeon or of one of his satellites ruthlessly tears her handiwork away in the act of removing the dressing of adherent gauze.

Often humanity prevails and the patient is subjected to a daily debauch of ether, in order to ease his suffering and to enable the would-be healer to carry out his fearful attack on Nature's handiwork, unperturbed by the protective screams and struggles of the victim.

May I have the help of all who chance to read this paper, to broadcast the good tidings that these happenings and their baneful effects can and should be avoided, and that by newer methods incomparably better results can be obtained than ever before in the treatment of suppuration in bones and joints.

I have written "newer" methods, but the great Lister did not favour frequent dressings, and Rutherford Morrison, by introducing the use of bismuth iodoform paraffin paste in septic wounds and advising infrequent dressings laid the foundation of the Winnett Orr treatment, which is to a large extent the theme of the present contribution, as far at least as the bones are concerned. My excuse for choosing a subject which has been so freely discussed of late years is that I have almost daily evidence in my practice that the beneficent message that the Winnett Orr method has definitely proved itself and that its application is simple and effective, has not permeated surgical practice in this country nearly as thoroughly as its worth deserves.

To refresh your memories, the Winnett Orr method is applicable to both acute and chronic pyogenic infections. It has been more widely accepted in its application to chronic conditions, but I am certain that its more important application is in the treatment of acute suppuration. In fact, if it were universally used in acute osteomyelitis, the number of chronic cases requiring treatment would rapidly diminish.

The treatment broadly consists of providing adequate drainage for the pus, of swabbing the wound out with an antiseptic (ether is the best, I think), and of loosely packing the wound with plain sterile vaselined gauze, the quantity of vaseline greatly exceeding the quantity of gauze.

Bulky dressings of gauze are then applied, and the limb is encased in a plaster of Paris cast with the joints in a position to avoid subsequent deformity. No sutures whatever are used. Wherever practicable a tourniquet is used and is removed only when the plaster cast has been applied.

This means that no vessels are ligatured unless, of course, any large vessels are cut and seen in the course of the operation. With properly planned incisions this seldom occurs. The dressings are not changed for some weeks. For more detailed accounts of the method I would refer you to Winnett Orr's writings and those of his many followers.

When I first used this method it was frowned upon by nurses, as they felt that it contravened the principles of drainage of an abscess.

It hardly needs any thought to realize that no method of drainage could be more adequate: the whole wound is kept open and every square millimetre of its area is covered by a film of inert substance, which allows the discharges to pass outward immediately and yet does not mix with them. At the same time the principles of rest to the healing parts could not be more adequately carried out than by the rigid fixation of the plaster cast and by complete abstention from changes of dressings for weeks on end.

A big factor against the advocation of frequent dressings is the very real risk of secondary infection which occurs with each dressing, particularly when it is carried out by nurses untrained in the "knife-and-fork" technique. When dressings are done only occasionally, the surgeon can do most of them himself, and this is the ideal state of affairs.

The omission of any sutures in wounds is, I find, a bitter pill for some surgeons to swallow. The sight of a huge, gaping, raw surface, when the operation is completed, provides a temptation for the insertion of at least a few sutures.

The obvious reason for insistence on this omission is, of course, the provision of absolutely untrammelled drainage, but there is another real objection to the use of sutures. They are very liable to give rise to stitch abscesses, and these form an ever-ready source of reinfection.

In actual practice, when healing is completed after the Winnett-Orr method of treatment, the scars are almost incredibly good, and in many cases compare very favourably with the scars on limbs resulting from ordinary surgical interference in non-septic cases.

Acute Osteomyelitis.

It is my practice in early cases of acute osteomyelitis, when the disease appears to be confined to the juxta-epiphyseal area of a long bone, to incise the periosteum over the abscess and to strip it as little as possible. If it is already stripped up by a subperiosteal abscess, I do not strip it at all.

The bone is then drilled, the drill being directed toward the area adjacent to the epiphysis. Usually only two drill holes are made, and then they are connected by removing the cortex and spongy bone between them. This is done whether free pus wells out from the bone or not. The surface area of bone removed varies with the size of the bone being dealt with, but seldom exceeds 2·5 centimetres (one inch) by 6·0 millimetres (one-quarter of an inch) in this type of case.

In later acute cases, when the periosteum is stripped up by an abscess extending well along the shaft of the bone, and when pus can be seen exuding from the Haversian canals, it is best, I think, to remove the bone down to the medulla as far along the shaft as these signs can be seen.

In other words, in acute osteomyelitis, I think that conservatism should be the watch-word, provided that sufficient bone is removed to relieve the tension of the pus.

Chronic Osteomyelitis.

Healing of large chronic bone abscesses can be secured only by very radical operative treatment. The object should be to convert a cavity into as shallow a groove as possible by freely chiselling away its sclerosed walls.

In patients who have become anæmic and weak from prolonged toxæmia, and in whom a bone cavity of large size (often extending from one epiphysis to the other) has to be dealt with, the general condition of the patient has to be carefully watched during the operation, and the surgeon should stop before it becomes alarming. These patients do not stand shock and hæmorrhage well, and it is better to deal with such extensive cavities in two or more sessions, doing one section at a time, than to risk a fatal issue by dogged persistence at one operation.

In situations like the head of the tibia, a large cavity cannot, of course, be converted into a groove, but as much of the front and side walls as is practicable should be removed.

The dressings and often the plaster cast soon become soaked with blood and discharges.

When a tourniquet has been used, the post-operative bleeding is free, especially from the femur, but I have never seen it alarming and have not yet had to remove the cast and dressings to deal with it. Naturally it would be alarming if large vessels were cut, and I cannot too strongly recommend Henry's exposures of the long bones, as set out in his little book on the subject, in order to avoid such accidents.

In acute cases the patient's temperature usually falls by lysis and often takes a week to reach normal. In chronic cases a febrile reaction lasting a week sometimes follows the operation.

The next difficulty which the patient and his ward mates and nurses have to face is the stench of the decomposed blood and discharges.

It is particularly hard to explain to the relatives that it is not of evil import, and they often get the impression that the limb is rotting away. The odour in a hot climate is sometimes so bad that they cannot be blamed for harbouring this thought.

I know of no effective method for combating this stench, but it is much less obvious if the limb is

left free from bed coverings and a free draught of air surrounds it. The open air is, in other words, better for the patient's physical condition and strongly enhances his popularity with visitors.

In cold countries it is common for the first dressings to be done six weeks after the operation. I am sometimes able to delay it for this period in acute cases in which the fœtor is slower in developing, but in chronic cases it often becomes intolerable in two or three weeks. In such circumstances a window is cut over the wound, and the outer dressings, but not the vaselined gauze, are changed. The vaselined gauze, unless extruded earlier, as frequently happens, is left undisturbed for six weeks from the date of operation.

So effective is this method of treatment that large septic bone cavities often require only two or three dressings to reach the stage of a surface healing sore.

Suppuration in Joints.

The problem of suppuration in joints is an entirely different one in many respects. We are dealing with closed cavities partially lined by synovial membrane and endowed with strong power of resistance to invading organisms.

It is remarkable how often the pus in an acutely inflamed joint cavity, even in a comparatively early stage of the infection, gives a negative result for organisms on culture. The principle of drainage has to be modified, as it carries with it insuperable difficulties.

I personally know of no method of draining any joint effectively and continuously; and I cannot conceive the possibility of any effective method being devised. Fortunately, not only is such drainage unnecessary, but if drains are inserted between the articulating surfaces of a joint, drainage is definitely harmful.

The reason I consider it unnecessary is that the surgeon has an excellent ally in the bactericidal mechanism, which is strongly developed in the lining of the joint.

The essential point in the drainage of a joint is to be sure that the tension of the pus inside the joint is eased; if this is not done, the protective mechanism is prevented from exercising its full power, and the infection may spread beyond the limits of the joint.

The principle of rest also presents a more difficult problem than in suppurative conditions in the bones and with it is essentially embodied the prevention of deformity.

Lastly, the varying anatomy of the different joints makes it necessary to study each joint as an individual problem. For the sake of brevity I propose to confine my remarks to the three joints which in practice are most commonly the seat of acute suppuration and in which lack of the most prompt and careful treatment leads to disastrous results.

These joints are the hip, knee and shoulder, and of these the one in which failure of adequate early treatment leads to inevitable tragedy is the hip joint.

Suppuration of the Hip Joint.

So often is suppuration in the hip joint undiagnosed in its early stages and so grave are the results of omission of early drainage that even in a paper on treatment I feel I must interpolate a few remarks on diagnosis.

The condition commences with pain in the knee, front of the thigh or hip, and the patient becomes acutely ill, with high temperature, rapid pulse, and toxic manifestations.

The one diagnostic clinical point is that attempted passive movement in any direction at the hip joint is prevented by muscle spasm; in other words, rigidity is as definite a sign as it is in acute peritonitis. The reason that I stress this point is that a diagnosis of rheumatism is frequently made and operation is delayed, often with disastrous consequences.

The capsule of the hip joint is very strong, is very far from the surface, and is surrounded by large, strong muscles. This makes it very difficult for the abscess to break through, and as a result septic absorption goes on rapidly, and great toxæmia is a feature of these cases. The pain on movement is so intense that often the patient resents the movements necessary for rubbing the back and changing the bed clothes, and a sacral bed sore commonly results.

X ray examination often reveals no abnormality for the first ten days, but sometimes reveals changes in a week. A well marked leucocytosis is always present, but it does not necessarily reach the 20,000 which some consider diagnostic of pus formation. Even if the abscess is not opened, the temperature will often fall within a few days from 39·4° or 40° C. (103° or 104° F.) to less than 37·8° C. (100° F.). The toxæmia and local rigidity are, however, maintained. X ray examination will then show changes in the joint (Figures I and II).

It sometimes happens that a fall in temperature still supports a diagnosis of rheumatism, and the joint is not opened. If left to itself the abscess will eventually find its way to the surface; but it may take several months to do so, and meanwhile the hip joint has been irreparably damaged.

In osteomyelitis of the neck of the femur the general symptoms are much the same as in suppuration in the hip joint; but the local symptoms differ in that movement of the hip joint is free.

Local tenderness just below the great trochanter or in front of or behind the neck of the femur will often assist in diagnosis. As the upper epiphysis of the femur lies within the hip joint, the condition very frequently goes on to suppuration in the joint; and these are the worst cases of all.

On account of the extremely bad results which follow untreated or badly treated cases, I would go so far as to say that if either condition is strongly suspected on account of local symptoms, and if the leucocyte count is higher than 15,000 per cubic millimetre, an exploratory operation is justified.

ILLUSTRATIONS TO THE ARTICLE BY DR. A. V. MEEHAN.

FIGURE I.
Shows hip joint seven days after onset of symptoms. The hip joint was full of pus. Note diminished joint space.

FIGURE II.
Showing hip joint eleven days after onset of symptoms in right hip joint. Note diminution of joint space and haziness of joint outline.

FIGURE III.
Note slipping of epiphysis. This soon occurs in osteomyelitis of the neck of the femur if the hip joint is not put up in abduction.

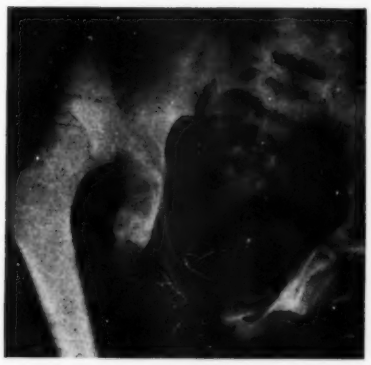

FIGURE IV.
Pathological dislocation as a result of osteomyelitis of the neck of the femur and suppuration in the hip joint.

FIGURE V.
Same patient as in Figure IV, showing dislocation reduced and neck of femur drained.

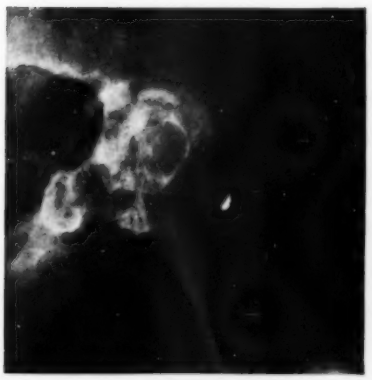

FIGURE VI.
Showing condition of hip twelve years after inadequate treatment. Wounds still discharging.

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The tragedy of neglected early treatment is accentuated by the occurrence of one or more extremely common complications. These are:

1. In osteomyelitis of the neck of the femur the epiphyseal cartilage becomes softened by the suppurative process; and the spasmodic pull of the great muscles attached to the upper end of the femur causes the epiphysis and the shaft to part company. The shaft is pulled upward, leaving the epiphysis in its normal position. Deprived of most of its blood supply, and surrounded by pus, sequestration of the epiphysis becomes almost a certainty (Figure III).

2. In primary suppuration in the hip joint pathological dislocation is very liable to occur; in order to diminish the pain, the joint is flexed and adducted by the patient. In this position the tension of the exudate in the joint is lessened and pain is not so great. The position, however, is an ideal one to favour backward dislocation, and when this position is combined with a softened capsule and strong muscular spasm, dislocation readily occurs (Figures IV and V).

3. The third complication occurs later, and is an erosion of the acetabulum, leading to shortening and deformity.

Early treatment consists of prompt drainage, and the three complications mentioned above must be avoided at all costs (Figure VI).

In osteomyelitis of the neck of the femur the operation consists of making a vertical incision on the outer side of the great trochanter and stripping up of the periosteum in front and behind. The posterior stripping should be done thoroughly, as pus is sometimes found here gushing out from the inner portion of the periosteum. A drill is then passed along in the line of the centre of the neck of the femur, extending nearly to the epiphyseal line. A small sharp gouge will serve the purpose as well as a drill. The drainage canal should be about 9·0 millimetres (three-eighths of an inch) in diameter.

In drainage of the hip joint I strongly advise an anterior incision. The sartorius and *rectus femoris* muscles are retracted outward, and this exposes the ilio-psoas muscle, which, in the presence of an acutely inflamed hip joint, is usually adherent to the capsule. With a blunt dissector its fibres are separated, and it is stripped off the capsule, which usually has a blue, bulging appearance. A free incision in the capsule completes the drainage. Whether the operation is for osteomyelitis of the neck of the femur or suppuration in the joint, the wound is packed with vaselined gauze and no sutures are inserted.

The next essential step is fixation of the joint in a position of full abduction and extension, with a few degrees of internal rotation. This position brings the great trochanter outward until the tip is brought to bear as nearly as possible upon the ilium, above the acetabulum. This, together with the relaxation of the muscles, controls the hip joint and prevents the three dreaded complications which I have discussed. The fixation is best achieved by the application of a plaster cast, extending from the axilla, and including the foot.

If the equipment and the training necessary for applying such a cast are lacking, the same object may be achieved by slinging both lower limbs in abduction and applying extension. This method is not so effective as the plaster cast and requires much more after-care and adjustment.

The wounds are not dressed for at least a fortnight, unless some special indication for earlier inspection occurs. The dressing is done through a window cut in the plaster.

The final result is a hip joint with little or no movement, but with the infection completely conquered and the joint in the most favourable position for function. Actually the final position to be aimed at in an ankylosing hip is about 15° of abduction, 20° to 30° of flexion, and slight internal rotation.

Suppuration in the Knee Joint.

The immense area of synovial membrane in the knee joint and its complex ramifications make the problem of relief of tension due to suppuration a difficult one. How useless it is to put a tube in on each side of the suprapatellar extension of the joint cavity and hopelessly to watch for the drainage which does not occur! The process of subsequent so-called irrigation is equally futile. The track between the two openings soon becomes surrounded by fibrinous lymph, and the effect of squirting antiseptic fluid in one side and out the other would fail to ease the surgical conscience of even the probationer nurse. Yet one feels, in studying this particular joint, with its many semi-closed synovial pockets, that some adequate method of irrigation of the whole cavity must be useful even to ease pus tension, especially as the rapid formation of fibrinous adhesions very soon converts this joint into a multiloculated structure.

It is without any hesitation that I state that such a method is available and, like all other excellent things, it is simplicity itself. To Cotton, of Boston, I believe the credit of this splendid idea is due, and it is my earnest wish that this paper will lead to its extensive use in Australia, as I find that it seems to be little used here.

If you happen to see an effusion into the knee joint in its early stages, you will find that the point of greatest swelling is in the suprapatellar synovial extension at a point immediately above and to the outer side of the supero-lateral angle of the patella. It is here that the synovial sac reaches its closest point to the skin surface.

In Cotton's method a small vertical incision about 1·25 centimetres (half an inch) long is made here, and after going through a very thin layer of muscle fibres, the knife enters the synovial cavity, and fluid under tension escapes. A rubber catheter is now inserted. The catheter is attached to a large irrigation tank, which should contain at least a gallon of sterile fluid (perhaps normal saline solution is the best) and which should be fixed at

such a height as to give a good "head" of fluid. The clamp on the irrigator is released sufficiently to allow the irrigating fluid, under pressure, to pass into the joint, and at once the whole joint will be seen to "balloon out". The sides of the wound are held together to prevent the fluid escaping. It is important, of course, not to have the fluid pressure great enough to risk rupturing the synovial membrane or over-distending the joint. The irrigator is clamped and the fluid is allowed to run out alongside the catheter.

This process is monotonously repeated for at least fifteen minutes, and the surgeon can then be sure that pus tension has been relieved in the joint. I think it is better not to suture the wound, but to apply a small dressing of vaselined gauze. If indications of pus tension develop again, the process may be repeated, but if the condition is an early one, it is seldom necessary.

The limb is put up in extension, preferably on a Thomas's knee splint, with a few degrees of flexion at the knee.

Early use of the quadriceps is encouraged by training the patient to "pull the knee-cap up" without moving the limb. When acute symptoms settle down, an increasing amount of daily active movement is allowed. Recovery with a useful degree of movement is the rule.

A tendency for flexion deformity to develop is often noticed after walking is begun, and this must be promptly dealt with by fitting a walking caliper with an anterior thigh curtain and a posterior calf curtain, until the tendency disappears. A plaster cast to keep the knee in a position just short of extension may be necessary for night wear as well.

Suppuration in the Shoulder Joint.

The approach to relieve tension in suppuration of the shoulder joint is the usual anterior incision between the deltoid and *pectoralis major* muscles. Admittedly this gives but a grudging view of the joint, but if the exudate is under tension, the capsule is made readily accessible as a bulging sac of fluid. A free incision is made in the capsule and the wound is filled with vaselined gauze down to the capsular wound.

In applying the principle of rest, the keynote is abduction. A plaster cast or an aeroplane splint is applied, which holds the upper arm abducted at 90° in the case of children (or 70° in the case of adults), rotated inwards 90° from the vertical position and inclined forward 30° from the coronal plane of the body.

Recovery with some shoulder joint movement often occurs, but if bony ankylosis occurs in the position described, an extraordinarily small amount of disability results, owing to the large degree of compensatory scapular movement, which saves the situation.

Early assisted active movement with the arm still on the splint is the best measure to favour recovery with joint mobility.

Conclusion.

I do not propose to weary you with long, monotonous case records; but you may accept my assurance that every point mentioned in this paper has been thoroughly and repeatedly tested out in my practice, and the patients have practically all been observed over a period of several years.

With perfect safety I can prophesy that those of you who have not yet adopted these measures will save an immense amount of suffering, chronic ill health and deformity if you decide carefully to study and adopt them.

THE TREATMENT OF CANCER OF THE LIP BY X RAYS.[1]

By E. H. MOLESWORTH, M.D. (Sydney),

Honorary Physician for Diseases of the Skin, Royal Prince Alfred Hospital; Lecturer in Dermatology, The University of Sydney.

THIS small paper is merely to put forward a method of treating cancer of the lip by X rays, a method which has given excellent results in my hands for the past five years.

It is only applicable when not more than half the depth of the lip from the edge to the reflexion of the mucous membrane to the alveolus is involved. The lip is everted and fixed with strapping. After this a dose of 700 *r* of X rays of the quality 120 kilovolts constant potential, with a one millimetre aluminium filter, is delivered to the inner surface of the lip over a semicircle, allowing one centimetre of apparently normal mucous membrane to come into the beam. Of this approximately 500 *r* survive at the opposite (skin) surface of the lip. Then the lip is allowed to fall back into normal position and a similar dose is delivered to the skin surface over a similar area, a piece of lead rubber being placed between the lip on the one hand and the teeth and alveolus on the other. This brings the dose at each surface to 1,200 *r*, and the distribution throughout the lip is quite even.

A dusky red reaction with some exudation occurs on the skin surface, and there is frank erosion on the mucous surface. This begins about eight days after irradiation and lasts for three weeks. Thereafter the improvement is rapid, and at the end of ten weeks the lip is well, with no remaining infiltration.

I have followed this technique now for five years, and the number of cases so treated now amounts to over fifty. In every case the tumour has disappeared. There were two recurrences—marginal in each case, and due to failure to expose a sufficiently wide margin of apparently healthy tissue. In only one case have the regional glands subse-

[1] Read at the Fifth Australian Cancer Conference, Canberra, April, 1934.

quently shown carcinomatous deposits. These two patients were operated upon subsequently at an early stage with apparent success.

Nearly all patients were in an early stage, and only comparatively few were subjected to biopsy. Nearly all were private patients, only a few recent ones being hospital patients. In most cases the suggestion that a biopsy should be taken was turned down by the patients simply on the grounds that they did not want any surgical procedure, no matter how simple. The matter could not be pressed. But I do not think that it will be seriously suggested that the clinical diagnosis will have been wrong in anything more than a very small percentage of cases, and this will not invalidate the results recorded.

This procedure shows that just as squamous carcinoma of the skin can be treated by X rays if applied with proper technique with a degree of success equal to that achieved by shorter wave-length radium rays, so squamous carcinoma of the lip can also be dealt with equally well by an X ray technique designed to get an even distribution of a dose of X rays calculated to produce the same degree of tissue reaction that is habitually brought about by radium implantation.

The successful application of treatment by radiation of much longer wave-length than that provided by radium filtered with 0·5 millimetre of platinum again casts doubt upon the oft-repeated, but never substantiated, statement that shorter wave-length radiation has a more selective action upon cancer cells than longer wave-length radiation.

This is only an extension of the evidence available that there is nothing to choose between radium and X rays in the treatment of squamous carcinoma of the skin. This I have frequently maintained, and is shown definitely by Miescher, who compared figures obtained at the Zürich clinic, of patients treated by X rays with those of patients treated by radium implantation at the Radiumhemmet, Stockholm (*"Die Behandlung des Hautkrebses", Schweizerischen Medizinische Wochenschrift*, Volume LXI, Number 13, 1931, page 299). In fact, it is an easily demonstrable fact that owing to the greater depth dose attainable by an X ray tube at 30 centimetres distance, this weapon is much preferable to a radium plaque, no matter how highly filtered. This, of course, is owing to the operation of the law of inverse squares, which makes the radium plaque incapable of supplying an effective dose at a depth of more than half a centimetre.

It is also interesting in that my experience supports the contention of the Regaud school that glands in the neck should not be excised unless palpably enlarged. The old doctrine that glands should be dissected, even if not palpable, in cases of carcinoma of the lip should, I think, be abandoned in the light of modern knowledge and experience.

Reports of Cases.

VON GIERKE'S GLYCOGEN ACCUMULATION DISEASE.

By PHYLLIS M. ANDERSON, M.B., Ch.M. (Sydney),
Senior Resident Pathologist, The Royal Alexandra Hospital for Children,

AND

D. G. R. VICKERY, M.B., Ch.M. (Sydney),
Honorary Relieving Assistant Surgeon, The Royal Alexandra Hospital for Children, Sydney.

D.J., AGED four years, a flaxen-haired little girl of placid temperament and in apparently good health, was first seen by one of us (D.G.R.V.) on September 22, 1933. The mother stated that the child had been developing a huge abdomen since the age of eighteen months, and that her friends were constantly advising her to see a doctor. The child had not suffered from any illness and had no symptoms of ill health, except that she grew tired when taken for a walk and had a waddling gait. She had been late in sitting up and had not walked until two years of age.

On examination she was well nourished and fat-faced; but the limbs were comparatively thinner than the rest of the body and the limb muscles lacked normal tone. She was 97·5 centimetres (thirty-nine inches) high (normal 97·5 to 100 centimetres) and 17·5 kilograms (thirty-nine pounds) in weight (normal). The special feature was the huge abdomen, its circumference at the umbilicus being 63·75 centimetres (25½ inches), as compared with the 50 to 52·5 centimetres usual in a child of her age. She had a small umbilical hernia, and the veins of the abdominal wall were very prominent. The liver margin could be felt 3·75 centimetres (one and a half inches) below the umbilicus, extending into the right iliac fossa; the liver was smooth, uniform and quite painless. The spleen was not palpable. The child drank rather freely, but her appetite was normal. The urine gave a strongly positive reaction for acetone, and the child's breath smelled of acetone.

She was admitted to hospital for investigation on October 4, 1933, and the next morning twelve grammes of glucose in 120 cubic centimetres of water were given for a glucose tolerance test. The fasting blood sugar content was 0·072% and only rose 14 milligrammes during the test period, that is, to 0·086%. There was marked acetonuria—approximately 250 milligrammes per 100 cubic centimetres of urine—but no glycosuria throughout. The same afternoon a test for adrenaline response was tried; but after the injection of 0·09 cubic centimetre (three minims) of adrenaline chloride solution the blood sugar content did not rise at all.

The child was unhappy the first two days in hospital, refused food and vomited several times. During the period of voluntary starvation there was a trace of sugar in the early morning specimen of urine, and the acetone bodies were less, quantitative estimations showing 68 milligrammes, 72, and less than 20 milligrammes of acetone per 100 cubic centimetres of urine for the next three days. Her blood urea content was estimated at 29·5 milligrammes per 100 cubic centimetres, blood cholesterol at 194 milligrammes per 100 cubic centimetres.

After two days on a ward diet the fæcal fat was found to be 15% of dried fæces. Because of the high carbohydrate tolerance and acetonuria, an effort was made to give the child a high fat diet to test its effect on the fat excretion and acetonuria. She refused much of the food, however, and the fatty-acid : glucose ratio of what she actually consumed was in the order of 1 : 1. Fæcal fat in a specimen on October 16, 1933, was 18% of the total weight of fæces.

During this period the excretion of glucose had become less, being 0·6 gramme for twenty-four hours

on October 11, 1933, and 0·45 gramme on October 14, 1933. The amount of acetone bodies was estimated at 25 milligrammes per 100 cubic centimetres on October 13, 1933, and 28 milligrammes per 100 cubic centimetres on October 16, 1933.

The adrenaline response was again tested on October 11, 1933, using four minims as the test dose, and again no rise in blood sugar content could be elicited. Attempts were made to demonstrate excess of glycogen-containing leucocytes; but their numbers were no greater than that

FIGURE I.

of a normal control. Examination of the blood revealed a mild anæmia and lymphocytosis. None of the hydatid tests done as a routine met with a reaction. X ray examination of the skull revealed no abnormality and of the liver region merely confirmed the existence of uniform enlargement. Neither mother nor child reacted to the Wassermann test.

The outstanding feature of the investigation was the rapid absorption of glucose and its fixity as shown by the failure to produce glycolysis with adrenaline. Normal

FIGURE II.

children respond with a rise in the blood sugar content of from 20 to 30 milligrammes within fifteen minutes of the injection; our patient stored glucose at a low blood concentration, and we never found a reading above 0·132% at any time of the day. The effect of a low circulating value was shown in the constant ketonuria, indicating incomplete combustion of fats. These facts, taken in conjunction with the enlargement of the liver, justify a diagnosis of glycogen accumulation disease of von Gierke.

The occurrence of glycosuria during the period of voluntary starvation was unexpected, and may be of significance in considering the mechanism of the disorder. Several estimations failed to reveal a high blood sugar content during the period, so the withholding of food did not produce mobilization of sugar above the normal excretion value. Injection of adrenaline could not increase its concentration, so sympathetic stimulation could not account for its presence in the urine, and the taking of a relatively high fat diet did not abolish the glycosuria, so that the sugar was not being used in the combustion of fats. Indeed, during this period, although there was this slight, but definite, glycosuria, the ketone bodies were at a lower level than when the child fasted or was on a mixed diet.

Comment.

The first case of this disease in Australia was described by H. J. Solomon and one of us (P.M.A.) in THE MEDICAL JOURNAL OF AUSTRALIA of November 11, 1933. Only five other cases appear to have been reported: Worster-Drought's case, with reference to von Gierke's three original cases; E. C. Warner's case; and a doubtful case by Bellingham Smith and O'Flynn.

The present case shows the salient features of the disease as hitherto reported, hepatomegaly in a child in the first few years of life, enjoying apparently good health, with ketonuria and a low blood sugar content, an absence of response to adrenaline being the outstanding laboratory finding.

FIGURE III.

Our patient, like all the others, except Bellingham-Smith's, was a girl child of placid temperament, who had walked late and tired easily; indeed, there is a striking similarity in the character of all these children. She had hypotonus and tired quickly, being unable to mobilize her glycogen rapidly; but the fasting value of 0·072% (obtained on three successive occasions) explains the absence of the convulsive turns seen in the other Australian case and Worster-Drought's case.

It appears that the sugar storage mechanism is too efficient and/or the glycogen mobilization too slow. The problem would seem to depend on the internal secretion concerned. Is the storage of glucose part of the function of insulin, and could an excessive production cause the condition? Does adrenaline mobilize glycogen, and has the child a deficient supply? As far as we know, synthetic adrenaline will not fill the want, if it exists. Is there a central mechanism controlling carbohydrate storage in the diencephalon? There are symptoms suggesting this in various pituitary disorders, and the fact that in all proven cases so far the patients have been girl children of similar habit and appearance, may suggest this common basis. Treatment, apart from that for the hypoglycæmic attacks, when they occur, is wholly expectant, the tendency of the child being to improvement.

It is indeed remarkable that the enlargement of the liver should be the only evidence of such a striking disorder of carbohydrate metabolism.

Acknowledgement.

Acknowledgements are due to Dr. Lorimer Dods, who performed the quantitative estimations of acetone during the child's stay in hospital.

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HEPATO-NEPHRO-MEGALIA GLYCOGENICA (VON GIERKE).

By A. HOLMES À COURT, M.D. (Sydney), F.R.C.P. (London),
Honorary Physician, Sydney Hospital,

AND

SYLVIA D. BRAY, M.B., B.S. (Sydney),
Radium Registrar, Sydney Hospital.

M.H., A FEMALE, aged three and a half years, was admitted to Sydney Hospital on May 10, 1933. She had been ill from the age of three months. She was said to have taken a fit at that time and had been admitted to the Renwick Hospital for Infants. The mother stated that the abdomen had been markedly enlarged at the age of six months and that the enlargement had been slowly progressive. The abdomen had been opened in November, 1931, and a general enlargement of the liver had been reported, the organ being normal in colour and consistency, without evidence of newgrowth. The fits and vomiting previously recorded had diminished in frequency and severity at the time of admission to Sydney Hospital. Both mother and child had failed to react to the Wassermann test, which had been applied on several occasions. The mother had a healthy child older, and a normal baby younger than the patient.

FIGURE I.

On examination the child appeared pallid, but not acutely ill. The mental development was retarded. She could neither stand nor speak, and dentition was delayed. The abdomen was grossly enlarged and protuberant, the liver grossly increased in size. The skeletal musculature was flaccid and toneless. The urine contained ketone bodies persistently. There was no glycosuria. No other ascertainable physical abnormality was detected on examination.

In the accompanying illustrations the abdominal distension is shown and the area of the liver is defined.

FIGURE II.

The results of a fructose tolerance test, performed on May 3, 1933, were as shown in Table I. An attempt was made to mobilize glycogen after the administration of adrenaline on June 29, 1933. The fasting blood sugar content was recorded as 70 milligrammes per 100 cubic centimetres. Thirty minutes after the administration by hypodermic injection of three minims of a standard solu-

TABLE I.

Fructose Tolerance Test.

Time.	Blood Sugar, in milligrammes per 100 cubic centimetres of Blood.	Acetone in Urine.	Sugar in Urine.
Before	57 (fasting)	No specimen obtainable	No reducing substance was present in urine at any time.
½ hour after	75	No specimen obtainable	
1 hour after	84	++	
1½ hours after	81	No specimen obtainable	
2 hours after	93	No specimen obtainable	
3 hours after		+++	

tion of adrenaline chloride, the blood sugar reading had not risen and was again recorded as 70 milligrammes per 100 cubic centimetres. In a control child of the same weight the figures recorded were 72 milligrammes and 108 milligrammes at corresponding periods.

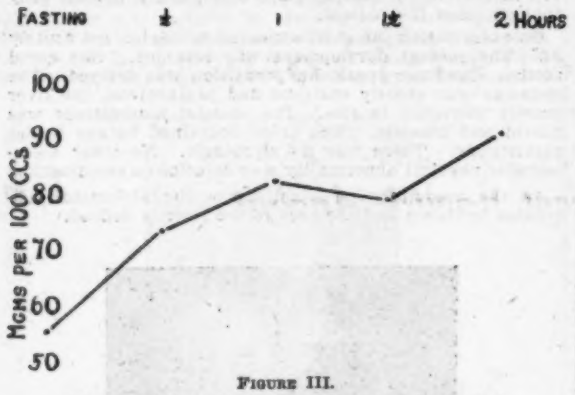

FIGURE III.

Graph showing result of fructose tolerance test.

The observed facts seem to establish the diagnosis of glycogen accumulation disease. The condition appears to be of sufficient rarity to warrant record.

Reviews.

CLINICAL GENETICS.

THE crux of all problems in human heredity is still bound up in the relative importance of these two terms, "nature" and "nurture", and what they stand for. And still we find that very little investigation of scientific value has been accomplished in regard to the matter—little when one has due regard for the importance of the problem.

The alternative title of the book under review, "The Methods of Clinical Genetics", by Professor Hogben, indicates clearly the substance of the matter set out in the contents.[1] Any work of a scientific nature on this question is well worthy of notice.

The so-called eugenists of a past day (and many of those who yet style themselves in this manner and attach themselves to societies as if the study of eugenics were a cult) had no eye for anything but the endowments of heredity. It is true that they plunged themselves into the investigation of the mechanism of inheritance, and as a result the science of heredity progressed by leaps and bounds. Geneticists and cytologists went from one success to another. It was natural for these students of heredity to regard the influence of nurture as of little account, especially since those who claimed the environment as the predominant and all-important modelling force, too often brought nothing but hearsay evidence to support their airy beliefs. The rival claims also became entangled with questions of religion, politics, and even literature. The matter was one of the subjects that the "man in the street" felt he was qualified to write and argue about.

The unfortunate position which has arisen in consequence, has undoubtedly delayed progress in preventive medicine and social economy.

During the last few years the whole problem has been attacked from a better angle, albeit by only a few workers. Amongst these Professor L. Hogben has been one of the most challenging and authoritative. Perhaps the obvious fact that he has more than a sneaking sympathy for the side which has hitherto been regarded with contempt by many eugenics propagandists lends spice to his criticisms.

The present book is an indication of the methods to be followed in an analysis of the data of human breeding. As the author states at the outset:

> Whatever else it may accomplish, genetic science can teach us much about the factors which determine susceptibility to disease for which curative measures are not yet available. It may thus make a substantial contribution to the prevention of diseases for which there is no simple remedy. . . . Knowledge of this kind is not easy to gain. Special methods are necessary because of the intrinsic difficulty of dealing with a species which breeds slowly, has few offspring, and cannot be mated by the investigator at will.

Possibly this difficulty has not yet been realized by the exponents of medicine, for genetics has almost no place in modern curricula.

The application of statistical methods plays a very large part in modern studies of heredity, and most of the chapters deal, in a very readable and comparatively simple manner, with this aspect.

The reader who can remember his mathematics will, however, be in a better position to follow the text than the non-mathematical who may find the substance difficult to digest whilst highly interested in the conclusions. The book is in any case a very valuable addition to the few which attack this most important subject in a critical and really intelligent manner.

PROGRESS IN RADIOLOGY.

"THE YEAR BOOK OF RADIOLOGY FOR 1933" is the second of its kind, the first edition having appeared in 1932.[1] The hearty reception accorded this work is very well deserved, and Charles A. Waters, who edited the section dealing with radio-diagnosis, and Ira I. Kaplin, who edited the section dealing with radio therapeutics, share the honours equally.

As a Chicago publication the text has only a faintly American flavour and the diction is very lucid and readable. The print and paper are very good, and the illustrations, from the original articles referred to, are well reproduced in miniature and on the whole are quite satisfactory. The subject matter is grouped neatly and is systematically set out in a table of contents, so that reference to it is made quite easy.

A very wide field is covered by the book, and the articles dealt with are taken from a large variety of journals—American, British, German, French, Swedish, Spanish, Canadian and Australian journals are referred to. The scope of the work is thus world-wide and the range of reading covered by it is enormous, apart from the translations necessitated. The full title of each article is given with an accurate reference to its origin, and the contents are fully extracted and epitomized without being unduly shrunken or telegraphic in form. A comparison made between many of the extracts presented in the "Year Book" and the original articles in the journals from which they were taken, indicated that nothing of importance had been overlooked and the facts contained therein had been accurately crystallized and presented in a very readable form.

The "Year Book" constitutes a review of reviews which must have overlooked very little new or interesting work, if any, that was published anywhere during 1933.

As a reference book it should be a most valuable and time-saving friend to any busy consultant who wishes to keep abreast of the latest advances in the field of radiology.

If this work reappears annually, and its editors maintain their present standard, it should be an essential to the bookshelves of every consultant physician or consulting surgeon or radiological specialist.

[1] "Nature and Nurture", by L. Hogben, M.A., D.Sc.; 1933. London: Williams and Norgate, Limited. Demy 8vo., pp. 144. Price: 6s. 6d. net.

[1] "The 1933 Year Book of Radiology", edited by C. A. Waters, M.D., and I. I. Kaplan, B.Sc., M.D.; 1933. Chicago: The Year Book Publishers, Inc. Royal 8vo., pp. 804, with illustrations.

The Medical Journal of Australia

SATURDAY, JUNE 9, 1934.

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COHESION.

THE members of the medical profession in Australia do not all realize what they owe to the British Medical Association. They have grown up with it in their midst; it has provided them with the means of corporate fellowship in matters scientific; they have turned to it time and time again in what are known as medico-political crises, when governments, friendly societies, hospitals and other bodies have adopted attitudes calculated to interfere with the freedom of medical practice. In other words, the British Medical Association has achieved its twofold end—the promotion of the medical and allied sciences and the maintenance of the honour and interests of the medical profession. The conditions of medical life and practice would be very different were there no central organization to bind medical practitioners together. Practitioners would be forced to form some association in which matters of medico-political importance might be discussed, even if they did not think it necessary to cultivate together the scientific side of their calling. When the organization to which they belong is one that has progressed for more than a hundred years, when that organization has been put to the test in many directions and on many occasions and has not deviated from its path, it is worth fostering. It is worth fostering, not by a few enthusiasts only, but by the whole profession —by general practitioners in city and country and by the members of every specialty. At the present time it is well to take stock and to determine whether the British Medical Association in Australia is being cherished as it should be cherished; whether there are potential sources of disharmony, or if not of disharmony, of lack of cohesion; and if dangers do exist, to determine what should be done to maintain the efficiency of the Association.

The British Medical Association in Australia at the present time is well organized. The several Branches are active; they are carrying out their scientific programmes and are maintaining the ethical standard of medical practice. The Branches are bound together by a central body, the Federal Council, that has been endowed with wide executive powers. The Association is probably in a stronger position than it ever was, and the meeting of the Parent Body, with its world-wide organization, to be held next year in Melbourne, should make its position still stronger. There are some people, however, who see in the many bodies that are being and have been formed outside the Association, potential sources of lack of cohesion. The radiologists have recently formed an Institute of Radiology. The surgeons have the Royal Australasian College of Surgeons. The physicians have the Association of Physicians of Australasia. The dermatologists have their own organization, and so on. Medical art and science are becoming so involved and so extensive that special knowledge must be sought in special places. Organizations are formed to meet these peculiar needs. Not for one moment would we deprecate the formation of these organizations; it is the inevitable accompaniment of progress. These organizations have their functions to fulfil and there is room for them. At the same time practitioners of special branches have to remember that they are members of a larger body than is represented in their own specialty and that

they owe something to that body. If the fabric of the larger body, as represented in the British Medical Association, were to be weakened in any way, the smaller or specialized sections would inevitably suffer. It would be foolish to suppose that as any one section of the medical profession grew in prosperity or strength, it could be self-sufficient. Just as no part of medical science can be cut off from the remainder, so can no body of specialists be entirely cut off from the whole profession. To the fearful we can say that there are no signs of weakness in the Association on account of other medical organizations. It is well to remember, as far as physicians and surgeons are concerned, that the President of the Association of Physicians of Australasia has been nominated as President of the British Medical Association to preside at the Melbourne meeting in 1935, and that the President of the Royal Australasian College of Surgeons is also Chairman of the Federal Council of the British Medical Association in Australia. These bonds are not without significance. Notwithstanding the present state of affairs, the Branches must not be content. They should strive continually for closer union between their members. This union, we believe, can be maintained by paying more attention to scientific activities. The selection of topics for discussion at monthly meetings is of the utmost importance in this regard. The subjects chosen sometimes cover too wide a range and on that account are not sufficiently attractive. The choice of speakers is difficult and needs much care. On the one hand men of experience with a message to deliver are called for; on the other hand the younger and perhaps more enthusiastic member, who is perhaps not so likely to attract an audience, must be encouraged. Speakers of both types can be invited to contribute to the same discussion. Further than this, subjects of importance to those interested in specialist bodies can sometimes be selected. It is then that members of these bodies will be able to show that they are not unmindful of the larger body and of what they owe to it. We do not believe that they will fail. The British Medical Association must remain the central meeting ground of all practitioners in medicine.

Current Comment.

THE EFFECT OF REST IN ANGINA OF EFFORT.

THERAPEUTICS in modern medicine are in many ways showing a tendency to return to first principles and to depend on mechanical rather than drug therapy; more use is made each year of posture, exercises and manipulation than of expensive drugs. Rest has always been a cardinal principle in the treatment of cardiac failure, but complete rest in bed is in general reserved for the advanced state of congestive failure and is less often applied to the patient whose chief, and perhaps only, symptom is what is known as the angina of effort. It has been a general experience that all sufferers from "ischæmic" cardiac insufficiency benefit by a period of complete physical rest, but the literature holds little information as to how lasting is the relief from pain and as to whether it is more beneficial to the hypertensive or hypotensive patients. Clifford Hoyle and William Evans, who have already been associated in some fruitful cardiac research, have again collaborated to investigate these aspects of the question.[1] Twenty-three patients, of ages between forty-four and seventy years, and an average of fifty-six years, were admitted to hospital for this purpose. Recent coronary thrombosis was excluded. The attacks, from the clinical aspect, were classical and were constantly provoked by a given effort. All patients failed to react to the Wassermann test. Each rested in bed for at least one month. Even slight voluntary movement was discouraged. The patients were prevented from leaving bed on any pretext and were not even allowed to wash themselves, all such duties being undertaken by the nursing staff. Anginal attacks were relieved by nitrite and recorded. The patients were allowed to get up gradually during the fifth and sixth weeks. In the seventh week they walked over a planned itinerary in the grounds of the hospital, under the authors' supervision. Comparisons of the pre-resting and post-resting periods were always made only after full resumption of the individual's usual habits.

The results showed that 17 out of the 23 obtained subsequent improvement; in seven this improvement was such that the severity or frequency of attacks was reduced by more than one-half. It was found that there was no characteristic of the angina which would indicate beforehand that rest would be favourable, except that a short duration of three months or less favoured improvement. A better result was achieved in patients with a raised blood pressure, so that great improvement occurred in five out of ten patients with a raised blood pressure, whereas two out of thirteen in whom the blood pressure was normal showed a similar response. In general the attacks were more often decreased in severity than in frequency. They were never

[1] *The Lancet*, March 17, 1934.

completely abolished after treatment by complete rest.

This is an important aid in the treatment of anginal cases which needs to be more widely known. There is a certain school of thought opposed to rest in such cases, on the principle that a better collateral circulation is maintained by continuance of exercise, and that rest may predispose to coronary thrombosis. Such theories are not confirmed by experience. Hoyle and Evans have performed a useful service in giving prominence and controlled confirmation to a cardinal yet simple principle of treatment for these unfortunate sufferers.

ARTIFICIAL RESPIRATION FOR TWO YEARS.

WITHOUT any suggestion that the modern craze for records has invaded medicine it may be asserted that the maintenance of artificial respiration for so long a period as two years is unique. Phyllis M. T. Kerridge gives the details of the case in which this extraordinarily sustained effort to supply the deficient respiratory forces was made, and the ingenious mechanical methods that were employed.[1] The patient was a man, sixty-three years of age, a sufferer from progressive muscular atrophy. Five years after the onset of his disease it was found that he was becoming subject to attacks of difficulty in breathing, due to failure of the muscles concerned. These attacks became more frequent, and finally life could be sustained only by continuous artificial respiration. Incredible though it may seem, relays of nurses and relatives carried out the necessary manœuvres night and day for fifteen months, at the end of which time Sir William Bragg suggested that some mechanical device might be arranged to replace the efforts of the human volunteers. The first contrivance consisted of two football bladders connected by a wide bore tube; one of these was rhythmically compressed by a simple lever system and the communicated pressure transmitted to the chest by the other bladder, which was firmly bandaged in place. A hot water bag was then tried, as the life of the bladders was very short. Finally, a small hydraulic machine, which actuated a rubber bellows, was constructed, and on the thorax was fastened a belt with an interlined rubber bag. This has been found to work well, and the patient is now able to keep the appliance in constant use without discomfort. A further improvement is being made by utilizing an electric motor. An interesting point made by the author is that in this case there cannot be any question of a nervous reflex element's assisting inspiration to follow expiration. Another and more practical consideration is that here is a method that appears simple and inexpensive, one that might be devised where it is desired to cope with such emergencies as respiratory failure in poliomyelitis, and where more elaborate and expensive forms of apparatus, such as Drinker's, are not available. In the case described no ill effects have been observed over a long period, and the patient is able to live an active mental life even though he is almost completely paralysed. His swallowing and speech are but slightly affected, and since he is described as carrying on his normal intellectual activities, any query as to the object or value of the measure is presumably sufficiently answered.

[1] *The Lancet*, April 14, 1934.

THE DIAGNOSIS OF TUMOURS BY ASPIRATION.

FOR many years now the histologist has been an essential link in the chain of cancer research and treatment. Unfortunately, however, there are limitations imposed upon his activities by the practical considerations of surgery; for it is not always possible, nor is it always safe, to perform diagnostic biopsy. Immediate examination of sections has its drawbacks also; for it limits the pathologist in his choice of deliberate and delicate methods of study. F. W. Stewart gives his experiences with the method of diagnostic aspiration of tumours, based upon the work of the last three years, during which 2,500 suspected growths have been examined.[1] He has employed the method of Martin and Ellis, in which the neoplasm is punctured by an "18" gauge needle through a small skin incision made with a bistoury after the instillation of a drop of "Novocain" solution. This technique prevents contamination by skin cells, and the needle, thrust into the tumour mass, picks up cellular material when the piston of the syringe is withdrawn. This material is smeared on slides, fixed, and stained in the ordinary way. The author has carried out aspiration smear tests on a large number of biopsy specimens, checking up his results with the findings of the sections cut in the usual manner, and in this fashion has learned the possibilities and limitations of the method. The most important tumours of the series are those of the breast, and here Stewart suggests that the method may be employed when patients are to be submitted to radiation alone, when radical surgery is felt to be of probably unfavourable outcome, when the opposite breast contains a suspicious nodule, and when it is difficult to distinguish the deeply seated abscess or cancer, the recurrent growth, or the rapidly developing fibro-adenoma. Many other types of tumour have been submitted to this method of diagnosis, and it would appear that any pathologist attempting it needs to readjust his usual criteria, not essaying a dogmatism that the examination of such a limited amount of material will not warrant, and meeting the surgeon in a sympathetic effort to arrive at truth. As to the place of the procedure, Stewart remarks that though many surgeons might be horrified by the introduction of a needle through healthy tissue into a new-growth, it has not been found to produce any evil results, and has established itself in his hospital as a permanent means of diagnosis.

[1] *The American Journal of Pathology*, Volume IX, Supplement, Special Number, 1933.

Abstracts from Current Medical Literature.

MORBID ANATOMY.

Histological Grading in Carcinoma of the Uterine Cervix.

LOUIS H. JORSTAD AND EUGENE S. AUER (*Surgery, Gynecology and Obstetrics*, November, 1933) have reported their investigations of the relation of histological grading in carcinoma of the uterine cervix to clinical grouping and prognosis. Broder's work in 1921 was quoted by the authors as an arbitrary division of malignant tumours into four grades, according to the number of undifferentiated cells found in the tumour. The authors compare this with the Schmitz classification of clinical groups: Group I, in which the malignant change is confined to the uterine cervix; Group II, in which the malignant change has spread to the adjacent vaginal wall; Group III, in which the uterus is still movable, but there is beginning thickening of one or both broad ligaments; and Group IV, in which the uterus is fixed. The authors find that the clinical grouping and extent of disease are much more important than grading from a prognostic standpoint. From the morphological standpoint there are two types of squamous-cell carcinomata of the cervix. Eighty *per centum* of the tumours show "pearl formation". The other type does not show this tendency to keratinization when undergoing the varying degrees of differentiation. The authors conclude from an analysis of the grading of all the cervical cancers treated by radium in their hospital from 1917 to 1927 that grading alone is of no prognostic value in cancer of the *cervix uteri*, as in many cases it is impossible to obtain the necessary information from specimens obtained at biopsy.

Nephritis Repens.

DOROTHY S. RUSSELL (*The Journal of Pathology and Bacteriology*, March, 1934) reports a case of early *nephritis repens*. The author in 1929 published an investigation into nephritis, in which she adopted a classification based on histological findings. (See THE MEDICAL JOURNAL OF AUSTRALIA, September 27, 1930.) The term *nephritis repens* was used to designate the "creeping or insidious nature" of what is known as chronic interstitial nephritis. In the present article the author points out that in 1929 she was not able to describe an early stage of *nephritis repens*. This deficiency she now makes good. She reports the condition as occurring in the right kidney of a man, aged forty-nine years. The left kidney of this patient had been removed sixteen years previously; in this kidney an early stage of nephritis was found, together with tuberculous pyelonephritis. The author offers evidence which, she holds, excludes the possibility that the early nephritis in the left kidney was the result of tuberculous infection. She describes the histological findings in the right kidney, and points out that the case gives definite evidence of the exceedingly slow course of this form of nephritis.

The Nodules of Silicosis and of Tuberculosis.

W. S. LEMON AND W. H. FELDMAN (*Archives of Internal Medicine*, March, 1934) have made a comparative study of the morphological reactions provoked in the lung by particulate silica and by bacilli of tuberculosis. Rabbits were used for the experiments. Suspensions of particles of silica of suitable size and number were injected into the trachea of normal rabbits. At the same time the same amount of a suspension of virulent tubercle bacilli of the avian type were injected into an equal number of normal rabbits. The animals were killed at intervals of from four hours to four weeks after inoculation. As a result of histological study, the authors come to the following conclusions: (i) The character of the cellular response to the irritative influences of particulate silica and to bacilli of tuberculosis is essentially the same; both promote the formation of characteristic tubercles. (ii) The properties of the provocative agent responsible for the production of the silicotic tubercle preclude the formation of a structure characterized by continuous progression. This contrasts with that formed as a consequence of the injection of bacilli of tuberculosis, which is usually progressive and destructive. (iii) The similarity of the structural unit or tubercle invoked experimentally by these two agents is so striking as to make their certain differential identification impossible by ordinary morphological criteria. (iv) Although the pathological characteristics of the two processes are practically identical during the early period of cellular progression, significant structural differences become evident as the duration of the diseases is extended.

Infective Silicatosis.

E. H. KETTLE (*The Journal of Pathology and Bacteriology*, March, 1934) reports some investigations on experimental silicosis. He reviews some of the work that has been done in this field. He points out that a pure dust fibrosis is not the only form of pneumonokoniosis met with in man. Very often the dust is associated with an infective process, usually tuberculosis. Tuberculo-silicosis is much more common than simple silicosis. He has "attempted to devise a technique that will admit of the initial use of an infective agent as a means of accelerating a silicotic process, while insuring that the infection is not progressive and will not therefore dominate the histological picture". He has injected kaolin and dead tubercle bacilli into the trachea of guinea-pigs. When kaolin alone is introduced into the lungs, it is actively and rapidly phagocytosed, considerable quantities can be introduced into the lungs, causing a pronounced and lasting reaction, and the dust can remain in the lung for long periods of time without causing any actual fibrosis. A very different result follows the introduction of a mixture of kaolin and dead tubercle bacilli. There is the same phagocytosis of smaller particles of dust, and large particles are encircled by syncytial or giant macrophages, but in addition there is a much more intense emigration of mononuclear cells, apparently called forth by the bacilli; areas of lung become solid with the dust and the exudate. Ultimately the bacilli disappear, necrosis sets in, and a zone of peripheral fibrosis is formed. The end condition resembles the isolated nodules that may be met with in human infective or tuberculo-silicosis. Though kaolin alone did not cause pulmonary fibrosis in 500 days, when it was combined with dead tubercle bacilli it gave rise to characteristic lesions in as short a time as 112 days. The author also found that the reaction caused by dead bacilli alone or by dead bacilli with inert dusts was of quite a different order from that which occurs when the dead bacilli are combined with active dust, such as kaolin. In discussing his results, the author points out that, though serious pulmonary fibrosis in man may be caused by the inhalation of silica without any accessory factor, this pure or simple silicosis is rarely of clinical significance. Even when tuberculosis has appeared to have been grafted on to a silicotic lung, the author has found evidence that the apparently pneumonokotic lesions were really infective from the beginning. He thinks that his experimental work supports this view.

Duodenal Lesions Following Pyloric Dysfunction.

C. B. MORTON (*Archives of Surgery*, March, 1934) draws attention to the two views that are held concerning dysfunction of the pylorus in peptic ulcer. According to one view, dysfunction of the pylorus is secondary to ulceration. According to the other, the pyloric dysfunction is primary and may therefore have some bearing on the ætiology of peptic ulcer. The author has carried out an experimental investigation by producing a pyloric dysfunction in dogs. The animals were studied radiologically and by exploratory operation or by necropsy at various intervals up to two years after the induction of the pyloric dysfunction. The dysfunction was produced by encircling the pyloric ring with a contractile band of jejunal muscle. It was found that this procedure might cause chronic inflammatory lesions of the duodenum.

The lesion in the dogs was a duodenitis, almost identical with duodenitis in man. In view of the definite clinical relationship between duodenitis and duodenal ulcer, the author thinks that his results are suggestive as far as the ætiology of peptic ulcer is concerned.

Congenital Heart Lesions of Inflammatory Origin.

GRETE STOHR (*Archives of Pathology*, March, 1934) discusses malformations of the heart of the newborn. She shows that according to the present day view most congenital heart defects are held to be due to abnormalities of development. She describes two cases in which cardiac malformation and aortic stenosis were present. The interventricular septum was completely developed in both instances; the development of the abnormalities was therefore assigned to a period later than the seventh or eighth week of intrauterine life. No hereditary ætiological factor could be traced in either instance. The author points out that the morphological changes found by her are generally considered to have an inflammatory origin. The histological observations, described in detail by the author, substantiate this view. She looks on the malformations as being secondary to primary fœtal inflammation.

MORPHOLOGY.

The Distribution of Parietal Cells in the Stomach.

E. H. BERGER (*American Journal of Anatomy*, January, 1934) determined the distribution of the acid-secreting parietal cells in the glands of representative areas of the stomach, thereby suggesting the relative ability of these areas to secrete hydrochloric acid. With respect to the distribution of the parietal cells over the fundus and body of the stomach, three observations have been reported by previous observers. Stohr stated that the parietal cells were greatest in number in the cardiac half of the stomach and were decreased in number towards the pylorus. Miyagawa concluded that the parietal cells were most numerous in the prepyloric region, especially near the lesser curvature. Paschkis and Orater noted that in the presence of chronic gastritis there was a decrease in the number of parietal cells. The present authors give an account of a histo-topographic study of eight normal and fifteen pathological stomachs removed at necropsy. In an average one of the eight normal stomachs there was a uniform distribution of the parietal cells of the body, except at the angle on the lesser curvature, where there was a slight but significant decrease in number, and in the fundal and cardiac regions, where there were about 50% less parietal cells than in the examined areas of the body of the stomach. The area of transition between the body and pyloric glands, on the lesser and greater curvatures, was found in nine comparatively normal stomachs. On the lesser curvature the transition was usually abrupt, and the area was situated just above the angle. On the greater curvature the transition was usually gradual. In the pathological stomachs, aside from any gross lesions that were present, hyperplasia and transformation and atrophy of the gastric glands were found in variable degree. These changes in the glands were present at the distal end of the body and adjoining the lesser curvature of the stomach, or were most marked in those regions when the glandular change was more widely distributed. The hyperplasia, transformation and atrophy were associated with a corresponding decrease in the concentration of the parietal cells.

The Vaginal Mucosa.

B. G. SMITH AND E. K. BRUNNER (*American Journal of Anatomy*, January, 1934), as a result of 272 biopsies from 104 women, and from operative and *post mortem* material, state that in their normal material massive desquamation of both superficial and middle layers of the vaginal epithelium, as described or inferred by Dierks for the menstrual period, does not occur at any period of the cycle. Occasional deficiencies of the superficial zone, as represented in sections, occur at every period; but the authors regard these as artefacts. The middle zone, or intraepithelial zone of cornification, is rarely exposed and does not suffer such losses. The average thickness of the superficial zone is appreciably greater during the premenstrual and menstrual periods than it is during the postmenstrual and intermenstrual periods. Comparisons based on the general average for the menstrual cycle indicate that the superficial zone has about the same thickness during pregnancy; it is decidedly thicker during pathological amenorrhœa; it is thinner and looser in texture after the menopause. The average degree of development of the intraepithelial zone of cornification is appreciably greater during the premenstrual period than during the other periods of the menstrual cycle. The low point is somewhere about the middle of the cycle.

The Brachial Plexus.

RUTH A. MILLER (*American Journal of Anatomy*, January, 1934) gives an account of the morphology and distribution of the brachial plexus throughout the various classes of vertebrates, and especially within the order of primates. The general evolutionary trend has been found to culminate in the great apes as regards complexity of distribution, and in the human as regards refinement of structure. Man's brachial plexus appears to be closely related to those of the other primates, and a logical outcome of a series of developmental processes. This observation is borne out by the occurrence of various anomalies of a primitive type in man. The most significant result of the survey is the conclusion to be drawn concerning the relationship between muscle and nerve. This relationship has been demonstrated to be a close one. The form of the brachial plexus is determined by the general morphology of the pectoral musculature, which is adapted to the type of locomotion peculiar to the different groups. More specifically, the distribution of the peripheral nerves of the plexus appears to be directly influenced by the size, position and importance of the muscles which they supply. Changes in nerves accompany those in the muscles. A variation in the position or extent of a muscle produces corresponding modifications in its nerve. A grouping of single muscles results in the concentration of their individual nerves into one trunk. The emergence or, conversely, the lack of development of a muscle as a separate entity brings about a similar condition in its nerve. The fact that nerves adapt themselves slowly to changes in the muscles seems to be borne out by the number of nerve anastomoses and the seemingly double nerve supply to the newer muscles. These results are in accord with the results of workers in the experimental field.

Congenital Perforation of the Clavicle.

A. WAERN (*Anatomischer Anzeiger*, January, 1934) records three cases of congenital perforation of the clavicle by the *nervus supraclavicularis*, and discusses its occurrence and frequency. In the cases illustrated it appears that it is usually the posterior branch of this nerve which perforates the bone.

The Fifth and Seventh Cranial Nerves.

E. A. CARMICHAEL AND H. H. WOOLLARD (*Brain*, July, 1933) find that in ten cases injection of the Gasserian ganglion caused complete destruction of the ganglion, as judged by the extent and completeness of the anæsthesia. They discuss the problem why a number of patients, after destruction of the Gasserian ganglion, lose taste on the anterior two-thirds of the same side of the tongue. Deep pressure pain depends on the integrity of the fifth nerve only. The afferent fibres of the seventh nerve, other than taste fibres, and of the third nerve, subserve a proprioceptive function and do not convey pain impulses. Blocking of the seventh nerve has no influence on the paræsthesia following destruction of the Gasserian ganglion. Throughout the investigation no evidence was obtained that impulses subserving pain in the face and orbit follow any pathway other than in the fifth nerve.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, Adelaide Street, Brisbane, on April 6, 1934, DR. ERNEST CULPIN in the chair.

The Treatment of Suppuration in Bones and Joints.

DR. A. V. MEEHAN read a paper entitled: "The Treatment of Suppuration in Bones and Joints" (see page 748).

DR. T. P. CONNOLLY said he had had great pleasure in listening to an excellent paper. He had been particularly struck with the excellent method of dividing the subject, and the points of early diagnosis.

DR. LEONARD MCKEON said that the paper was thorough, and typical of Dr. Meehan's work. He had been a patient of Dr. Meehan and had seen his thoroughness and also his successful treatment of these patients in hospital.

DR. J. W. BEAN said that he was not a surgeon at all and would not venture to discuss such a paper; but in his reading he had found a point that might interest Dr. Meehan. In the treatment of impetigo, instead of frequently cleaning the scabs off, the sores did infinitely better if hermetically sealed dressings were put on. The stench was marked; but if the sores were kept covered for a week they healed much better.

DR. A. C. F. HALFORD congratulatd Dr. Meehan on his very well balanced paper, and more particularly the very earnest appeal he had made for the early recognition and diagnosis of osteomyelitis. It was always refreshing to hear of a man's operating and giving details of the methods he had tried out, with such great earnestness and confidence. Dr. Halford was not enamoured of the Winnett Orr method; he had certainly never used it. There was one question he should like to ask Orr; as he was unable, he would ask Dr. Meehan. Why plug the cavity in the bone with anything at all? If one wanted adequate and free drainage, why put anything in it? Also, were surgeons going to be satisfied to treat wounds in a manner that would produce an odour that was more than remarkable? Did Dr. Meehan really think there was no more refined method of treatment of suppuration in bones than this, accompanied, as it was, by what was now called "a good stink"?

DR. E. S. MEYERS congratulated Dr. Meehan on his paper, given in his usual good style. Dr. Meyers's remarks were based on the treatment of these lesions in adults, and those, moreover, the less fortunate members of the community. He thought the first thing was to treat the patient with common sense; he considered it was a great pity that names were attached to methods of treatment. In broadcasting the Winnett Orr method, people got the idea that all they had to do was to use this method and all would be well. Dr. Meyers had seen this method, like Dr. Halford and other surgeons, abroad, and was not yet satisfied with it. If anything happened under the plaster, it was hard to know what it was; medical practitioners would agree that something important might be missed. He would remind them that methods used during the war with eusol had given good results. J. B. Murphy and Robert Jones had laid down good methods before the war, and Dr. Meyers thought that these methods should be kept in mind. Perhaps in the public hospital type one had the person not so able to overcome infection. Dr. Meyers asked if any treatment could be found to prevent or ameliorate multiple osteomyelitic infections.

In regard to disease of the hip joint, Dr. Meyers was not sure whether Dr. Meehan had spoken of children or adults. This was an important point. In arthritis following infection in a hip joint, a sequestrum might form; this must be removed before the condition would clear up. Dr. Meyers had been very interested in the exploration of the hip joint, and was sorry Dr. Meehan had not exactly described the methods of approach. In adults one could open the hip and find very little pus. He was interested to hear that in most cases the joint became stiff, as that had been his experience. In treating the knee joint J. B. Murphy had said that the first thing to do was to extend the joint. Glycerine and many other things had been used at the Brisbane Hospital with formalin for injection; gentian violet and "Acriflavine" had also given good results. Treatment of the knee joint by active movement from the beginning of the infection was used by the Belgian surgeon Wilhelms. Dr. Meyers had found that most of the patients complained very bitterly of the pain. He should like to draw attention to the treatment of those very awful cases that Dr. Meehan rightly deplored. At the Brisbane Hospital there were many of these, and Dr. Crawford was having good results with the maggot treatment. In conclusion, he congratulated Dr. Meehan on the trouble he had taken in preparing his paper.

DR. L. G. HILL congratulated Dr. Meehan on his interesting and very thorough discussion of the subject. He inquired whether any distinction was made as to the infecting organism. Two years previously, Nathan, in America, had drawn attention to streptococcal infections following influenza *et cetera*, accompanied by sudden onset of pain and fever; the organisms could not usually be cultured from the blood. By extension alone in a series of these cases the disease had been cured, and full movement had been obtained. If a joint were opened in such cases, ankylosis generally resulted. In staphylococcal cases the condition progressed as Dr. Meehan had said. With regard to infection of the knee joint, the universal opinion in London was that aspiration alone produced better results than washing out the joint, or any other treatment. Research had shown that synovial fluid ranked very high in bactericidal power when fresh; when stale it was a good ground for growth; aspiration overcame this, and the inflammation subsided. It had been suggested that chloroform anæsthesia should always be used in pneumococcal infections; chloroform was supposed to be the only substance that could deal with the pneumococcus in the blood stream, limiting its activity and preventing its growth.

DR. DONALD A. CAMERON thanked Dr. Meehan for his very interesting paper. It was the type of paper wanted more often, and had caused a good deal of discussion. Over a period of years at the Hospital for Sick Children it was extraordinary to see how the treatment of these conditions had altered. He had found that sometimes a joint would have to be washed out more than once. Dr. Meehan had stated his facts very clearly.

DR. WALTER CROSSE congratulated Dr. Meehan on his excellent paper. He had tried the Winnett Orr treatment for the mastoid cavity, and had had excellent results by packing with vaseline gauze. The only thing that had worried him was the proximity of the cavity to the brain, the Eustachian tube, and the inner ear. The cavity had been so much easier to dress than when there had been the daily crying match after iodoform gauze had been used. When Dr. Crosse had removed the vaseline gauze he had found good firm granulations underneath, with streamlets of discharge welling up between the strands of gauze. Dr. Halford had said: "Why pack?" Dr. Crosse had tried not packing and had found that the cavity filled with weak granulations and discharge. On the other hand, the removal of firm packing revealed firm granulations. One large mastoid cavity had only been dressed about three times, and the patient had done very well.

DR. ERNEST CULPIN said he should like to bring forward just one aspect of the question, that of meddlesome dressings. There was an analogy between the ear, nose and throat surgeon's work and Dr. Meehan's work, and that was the necessity for efficient drainage and the harm done by too frequent dressings and unnecessary syringing. The question of systemic treatment had some importance. It had been exercising Dr. Culpin's mind for some time that many conditions required systemic treatment as well as, if not in place of, local treatment. There had been an article in an American journal on surgery and dietetics,

which had set out to prove that dietetics were at least as valuable as surgery. The usual diet produced a kind of acidosis, consisting, as it did, of various kinds of meats and starchy foods. An alkali-producing diet should be better. Another point of importance was calcium metabolism; sufficient calcium should be taken and assimilated; the daily requirement was one gramme of calcium oxide, which should be provided in the food. The elimination frequently was in excess of the intake. It had been found in three thousand surgical cases reviewed in New York, that in only two had the patient retained the necessary daily amount of calcium. In this respect it was a common habit to prescribe calcium; but it must be remembered as well to eliminate or reduce the sodium chloride, as an excessive ingestion of this would lead to an excessive excretion of calcium chloride. Dr. Culpin also referred to the maggot treatment, as mentioned by Dr. Meyers. He had recently had the opportunity of seeing a patient with osteomyelitis successfully treated by this method.

Dr. Meehan, in reply, thanked his hearers for the very kind reception they had given his paper, and for the discussion. He was very interested in getting the knowledge of improved methods of treatment in this work broadcasted, and the methods used. He had felt urged to write the paper when he had considered the amount of pain suffered by patients who were treated by frequent dressings. He had been using the Orr methods of treatment, in principle, since 1918, and had adopted them *in toto* for the treatment of hæmatogenous infections since 1927, when he had heard Winnett Orr read his paper in America.

In reply to Dr. Bean, Dr. Meehan said that he had heard that a similar treatment for impetigo was being used at the Hospital for Sick Children.

Replying to Dr. Halford, Dr. Meehan said that he felt it a compliment for Dr. Halford to be there, as he had been ill so recently. Dr. Meehan did not like the word "plugged"; the gauze was not packed tightly, but lightly. Dr. Crosse had given a good description of the streamlets of discharge oozing out around the vaselined gauze. One must have a little pressure in the wound. If dry gauze or gauze soaked in antiseptic solution were used, the wound would become plugged. Dr. Halford had mentioned the offensiveness as a point against this method of treatment. Dr. Meehan did not adopt new methods readily; in America particularly new methods had risen and fallen, and frequent new ones were still being devised and described. Nothing had given Dr. Meehan more satisfaction than the results of this method of treatment, though he would admit that he should like to get rid of the odour. Iodoform counteracted it a little; but the nurses at the hospitals preferred the fœtid odour without the iodoform. The odour was not quite so bad if the limb were kept without blankets. The only way out was to cut a big window in the plaster and remove the outer dressings; but there should be no interference with the vaselined gauze, as the smell came from the decomposing discharge in the outer dressings. The plaster removed should be replaced or a fresh piece put in to avoid "window œdema".

Dr. Meyers drew a distinction between adults and children in these cases. Dr. Meehan did not think there was much difference; in adults the problems connected with the epiphysis did not arise. As to pressure, one had sufficient slight pressure with the gauze, dressing and plaster, and the granulations had something to grow against. The best example of this was a varicose ulcer dressed with an "Elastoplast" bandage, giving pressure. The fear of the extension of the infection under the plaster had deterred Dr. Meehan from using the method in acute cases for a long time. If the patient's fever did not subside or if he complained of pain, one could always cut the plaster away and see. But this point was of no importance when one considered the good results obtained. Statistics showed that there were fewer deaths with this method. Dr. Meyers had mentioned eusol and other methods of treatment; but he did not include the Carrel-Dakin method, which, as an antiseptic method, was very hard to beat. But unless one had special nurses *et cetera*, it was difficult to follow it out. The particular method Dr. Meehan used was easy to follow out, though undoubtedly, as Dr. Meyers had said, good results had been obtained with other methods. Dr. Meehan agreed that it would be very helpful if some systemic treatment could be found to improve the general condition; most of the infections were staphylococcal. He had not observed any benefit from vaccines or colloid substances. He agreed that operation on the hip joint was much easier in children, in whom one more frequently found a bulging capsule. The approach described was the most useful one, though Dr. Meehan did use others. In chronic cases sequestra had to be removed. Extension was always used in the treatment of infected knee joints. Dr. Meehan had not discussed other methods, not because he did not approve of them, but because he was describing the methods he used, with which he obtained good results. Dr. Meyers had mentioned Wilhelms's treatment. Dr. Meehan had not seen anything in the literature about this method recently; but certainly it was found that if the joint was moved at the time of operation, much discharge was removed. He thought the method caused too much pain to be used in the average case. He thought the maggot treatment should not be condemned purely on account of its repulsiveness. He was certain that good results were obtained by it; but again, a special hospital *et cetera* would be required. Baer had started the treatment. It was difficult to breed a colony of sterilized maggots; and this was what the method entailed. The maggot treatment was always combined with rest and the application of plaster. Dr. Meehan said that he had been interested in Dr. Hill's remarks; he found that the infection was nearly always due to a staphylococcus. Dr. Meehan had never opened a pneumococcal joint. Probably a number of these did settle down; but if there were any doubt, the joint should be opened. Dr. Meehan thanked Dr. Cameron for his remarks; he had not found it necessary to wash out the same joint by Cotton's method more than once. He was glad to hear that Dr. Crosse had obtained good results in similar treatment of mastoid cavities, though conditions were a little different there. He had been very interested in Dr. Culpin's remarks, and should like to hear more on that aspect of the subject.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Royal Alexandra Hospital for Children on April 16, 1934. The meeting took the form of a series of clinical demonstrations. The first part of this report was published in the issue of June 2, 1934.

Hysteria.

DR. W. VICKERS showed a girl, aged twelve years, who had been admitted to hospital on March 22, 1934. She had previously suffered from measles and whooping cough. Two months before admission the mother noticed that the child was limping on the right leg. One week later she complained of pain in the thigh, sharp in nature, which made her scream. This continued until three or four days before admission. The patient had been resting in bed since the onset. She lost a little weight. The appetite was good. She had had a cough for six weeks, but there was no sputum. Examination revealed a healthy child, standing with pelvis dropped. The right leg appeared larger than the left. There was wasting of the right gluteal muscles, with flattening of the right buttock. There was scoliosis. Movement at the hip joint was free. X ray examination revealed no abnormality, and there was no reaction to the Wassermann or the von Pirquet test.

Infective Purpura.

DR. E. H. M. STEPHEN showed a girl, aged nine years, who, ten days prior to admission, had complained of pain and nausea in the pit of the stomach, worse after food. Purpuric spots were noted on the hands. Four days later dark blood was seen in the stools. Five days later

swelling of thumbs, ankles and elbows developed. She became feverish and vomited. Three days before admission there was hæmaturia. Purpuric spots appeared on elbows and feet. The patient frequently suffered from sore throat; but there was no history of pains or swelling of joints. At the time of admission the child looked flushed and very ill. There was pyrexia. There were numerous purpuric spots on the soles of the feet, elbows and palms. There was no effusion into the joints nor tenderness of the abdomen. The liver was palpable, the spleen not.

Examination of the blood revealed normal bleeding time and coagulation time. The platelets were slightly reduced in number (there were 190,000 per cubic millimetre); the red blood cells numbered 4,100,000 per cubic millimetre, the white cells 23,000 per cubic millimetre; the polymorphonuclear cells were in the proportion of 87%, lymphocytes 11%, mononuclear cells 2%. Examination of a smear from an ulcer of the gum revealed no organisms of Vincent's angina. No hæmolytic streptococci were cultured. No organisms were cultured from the blood. The degree of fragility of the erythrocytes was normal. There was neither direct nor indirect response to the Van den Bergh test. Microscopic examination of the urine revealed two to six pus cells per field when a one-sixth inch objective was used. Irregular pyrexia continued for seven days; hæmaturia persisted for nearly four weeks.

Rheumatoid Arthritis.

Dr. Stephen next showed a girl, aged nine years, who had been admitted to hospital on February 9, 1934. Two years previously she had had a swelling of the interphalangeal joints, followed by puffiness of the dorsum of the right hand, pain and limitation of movement at the wrist. Two months before admission there had also been pain and swelling of the left wrist and both ankles. At the time of admission there was slight irregular pyrexia. The tonsils were slightly enlarged. The cardio-vascular system was normal. The spleen was not palpable. There was no enlargement of lymphatic glands. The left ankle was fixed at a right angle. The right and left wrists were swollen and tender and their range of movement was limited. The right ankle was slightly painful and tender.

Non-hæmolytic streptococci were cultured from the throat and teeth. A vaccine was prepared. The fractional test meal and glucose tolerance curves were normal. Examination of the blood revealed slight achromic anæmia. There was slight neutrophile leucocytosis.

Treatment consisted of vaccine therapy, hydrotherapy and massage, extraction of septic teeth, tonsillectomy, and manipulation of the left ankle under a general anæsthetic. Progress was satisfactory.

Dr. Stephen's next patient was a boy, aged eight years, who had been admitted to hospital in August, 1932. His illnesses had been pertussis, measles and tonsillitis. At the time of admission he had been suffering from asthenia, sore throat, and stiffness of the neck for ten days, and pains in the right arm and right leg for one week. The right knee was swollen and painful. There was rigidity of the neck. Kernig's sign was absent. The tonsils were enlarged, but not inflamed. There was no sign of cardio-vascular disease. Examination of the chest revealed no abnormality. Clear fluid under pressure was obtained on lumbar puncture. The temperature remained in the region of 40° C. (104° F.) for four days, then dropped suddenly to normal and remained thus for two weeks till discharge in September, 1932.

The patient was readmitted four months later with swelling of the angle and knee joints, which had been noticed for a fortnight, and swelling of the joints of the hands for one day. The knee joints were swollen and hard, the ankle joints puffy. One week after admission an injection of sterile milk was given; a reactionary fever of 38·9° C. (102° F.) resulted. The fever subsided seven weeks after admission. The joints of the wrists and ankle were still swollen. A vaccine was being given at this stage.

A fortnight later the joints of the phalanges became swollen. Twelve weeks after admission the tonsils and adenoids were removed. Twenty-two weeks after admission the hands were greatly improved, and massage was commenced. Twenty-three weeks after admission the leg was put in a Hamilton splint. Seven weeks later the hip was manipulated under general anæsthesia. Nine days later the patient attempted to walk; he was discharged at the end of a further period of three days, after approximately nine and a half months in hospital.

Treatment consisted of rest, hydrotherapy, vaccine therapy, protein shock, the administration of salicylates, tonsillectomy, and massage.

Dr. Stephen also showed a boy, aged eleven years, who had been admitted to hospital in May, 1932. Previous illnesses had been scarlet fever at the age of five years, diphtheria at four years, and whooping cough at seven years. For five weeks prior to admission he had suffered from pain and swelling of joints. He still had pains in the back; his wrists were swollen and tender, and movement was poor. Examination of the heart revealed no abnormality. After admission there was irregular pyrexia for six days, the temperature rising to 38·9° or 39·4° C. (102° or 103° F.). No organisms were cultured from the blood. The temperature became normal for one week, then rose again. A cardiac murmur developed at the pulmonary area, and pericarditis was suspected; the heart sounds were distant; but the patient was not distressed. Four weeks after admission the wrists were entirely without pain; the systolic murmur could still be heard in the pulmonary area; the temperature was normal. Sixty days after admission the patient was allowed up. Approximately 75 days after admission the cardiovascular system appeared to be normal. Massage was applied to the neck. Three weeks later there was full movement of the neck. The patient was discharged on September 24, 1932.

The patient's serum did not react to the Wassermann test.

Three months after discharge to Canonbury Convalescent Home, the fever returned; but the joints were not affected. Secondary anæmia reappeared, and neutrophile leucocytosis returned. For twelve weeks the patient had an irregular temperature up to 39·4° C. (103° F.).

Staphylococcus aureus and a streptococcus were isolated from the teeth, and a vaccine was given. X ray examination of the chest showed the heart to be still enlarged, but less than during the previous stay in hospital; it also showed the wrist to be affected with well marked arthritis. The patient was discharged after approximately twelve weeks; pyrexia still existed.

Gradenigo's Syndrome.

Dr. Stephen pointed out that Gradenigo's syndrome consisted of: (i) acute *otitis media*, (ii) homolateral temporo-parietal pain, (iii) homolateral paralysis or paresis of the external rectus muscle. These signs and symptoms were supposed to be due to serous meningitis in the region of the petrous portion of the temporal bone.

Dr. Stephen, in the absence of Dr. W. Ramsay Beavis, showed a boy, aged twelve years, who had been admitted to hospital on February 15, 1934. Two months previously he had first complained of earache on the right side; this had lasted, on and off, for four weeks; he had been slightly deaf on the right side since. There was no discharge from the ear. One month before admission, headache, independent of earache, commenced; it was continuous for over two weeks. For two weeks prior to admission there had been diplopia. There was failure to rotate the right eye outwards. For five days there had been pain on turning the neck.

At the time of admission the temperature was 37·5° C. (99·6° F.), the pulse rate 120, and respiration rate 24 per minute. The head was tilted back and the chin turned to the right. There was twitching of the right side of the face. There was no staggering gait. There was general weakness, but no paresis. There was marked enlargement of the cervical glands on the right side, with tenderness. There was some enlargement of the left cervical glands, but no tenderness. The optic disks appeared to be normal. There were paralysis of the right external rectus muscle, deafness on the right side, and doubtful paralysis of the right half of the palate. The head was held in a position

of torticollis (ocular torticollis) to the right. The right *membrana tympani* appeared thickened and inflamed. The leucocytes numbered 12,000 per cubic millimetre, polymorphonuclear cells being in the proportion of 68%. Radiographic examination revealed no abnormality.

Dr. Beavis performed right myringotomy, and thick pus escaped. Lumbar puncture was performed; the cerebro-spinal fluid was under greatly increased pressure. Examination of the cerebro-spinal fluid showed no increase in cells, and there was no increase in the globulin content. There was some improvement; but headaches became more frequent and severe, and there was marked drowsiness. The right mastoid region was explored; no pus was found in the middle ear; granulations were noted; there was slightly increased vascularity of the mastoid; the *dura mater* over the middle cranial fossa was normal. There was a steady improvement; but at the time of the meeting there was still an ocular torticollis.

Encephalomyelitis Following Measles.

Dr. Stephen also showed a female patient, aged four years, who had contracted measles in June, 1933, and six weeks later had been unable to stand. She slept poorly and was irritable and nervy. She lost considerable weight, and the muscular weakness became more marked. Four months after the onset of measles she was admitted to hospital. The lower limbs were quite powerless. The knee jerks were absent. There were some loss of power in the arms, and difficulty in sitting up unless supported. Nine months after the illness began she was able to raise her legs from the bed, and at the time of the meeting she was able to walk. In disposition she had changed from a peevish, suspicious child to one of a sunny type, quick to notice and respond.

(To be continued.)

Correspondence.

THE FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE.

SIR: A medical association of more than passing interest to Australians is the Far Eastern Association of Tropical Medicine. It must be recognized that more and more as Australia's tropical population grows, and as the importance of Australia's tropical dependencies increases, so also will increase the number of cases of purely tropical diseases seen in Sydney and other large medical centres. It cannot be claimed that the tropical diseases receive sufficient attention during the medical course to enable the general practitioner to recognize such diseases when they present themselves to him.

The Far Eastern Association of Tropical Medicine provides an opportunity for acquiring the most authentic and up-to-date opinions on tropical problems. This society meets once in every three years. At the congresses of this Association the leading medical authorities of India, China, Malay States, Japan, Dutch East Indies, Philippines, and many other countries, impart their discoveries and opinions. These are embodied in the collected papers and supplied free to members; as a rule these collected papers comprise two or three illustrated volumes. The subscription is a sum of £3 for the three-yearly period. The advantages of membership do not cease, however, with the acquisition of the collected papers. The congress is held at different locations each triennial period, and these cities are generally of profound interest to Australians, for example, Calcutta, Batavia, Tokio, Pekin, Manila *et cetera*. The government of the country concerned makes every effort to show the visitor the most unique and interesting sights, with the result that members see buildings, palaces *et cetera* often not available to the ordinary tourist. Moreover, steamship and railway concessions are granted for travel to and from the country where the congress is being held. Briefly, in addition to the valuable medical experience gained, not only from papers, but from actual patients, the medical traveller has all his travel, hotel, and language difficulties smoothed out for him. The next congress takes place at Nanking, October 1 to 7, 1934.

The programme is as follows:

Monday, October 1:
- 9 a.m.—Meeting of the Council; registration of members, distribution of badges and literature *et cetera*; visit to the Central Field Health Station.
- 3 p.m.—Opening of Congress.
- 8 p.m.—Dinner by the President of the Executive Yuan.

Tuesday, October 2:
- 9 a.m. to 12 noon.—Meetings of scientific sections.
- 2 p.m.—Visit to the Central Hospital.
- 4 p.m.—Visit to the Mausoleum.

Wednesday, October 3:
- 9 a.m. to 12 noon.—Meetings of scientific sections.
- 2 to 4 p.m.—Meetings of scientific sections.
- 8 p.m.—Dinner by the Director of the National Health Administration and of the Central Field Health Station.

Thursday, October 4:
- 9 a.m. to 12 noon.—Meetings of scientific sections.
- 2 p.m.—Visit to the Tangshan Health Centre.

Friday, October 5:
- 9 a.m. to 12 noon.—Meetings of scientific sections.
- 2 to 4 p.m.—Meetings of scientific sections.
- 4 to 6 p.m.—Garden party given by the Chinese Medical Association, Nanking Branch.

Saturday, October 6:
- 10 a.m.—General business meeting and closing of Congress.
- 8 p.m.—Congress dinner.

Tours of the country, beginning on Sunday, October 7, 1934:
- Tour 1: To Peiping via the Tientsin-Pukow Railway.
- Tour 2: To Hankow via the Yangtze River.
- Tour 3: To Hangchow via the Nanking-Hangchow Highway.
- (The Congress will provide guides through the local committees to accompany the parties and assist in making arrangements for transportation.)

Any Australian practitioner desirous of spending a profitable and interesting holiday would do well to consider the advisability of joining this congress. Intending members should apply to Dr. R. W. Cilento, Canberra, or Dr. A. H. Baldwin, School of Public Health and Tropical Medicine, University of Sydney.

Yours, etc.,

A. H. BALDWIN.

The School of Public Health and Tropical Medicine,
University of Sydney,
May 30, 1934.

MEDICAL NAMES IN GEOGRAPHICAL NOMENCLATURE.

SIR: May I be permitted to add the following details to Professor Cleland's article in your issue of April 28?

Harris Park is called after Surgeon John Harris, who died there in 1838. It adjoins Parramatta.

Sir John Jamison, M.D. (R.N.) (1776-1844) was the son of Thomas Jamison, who came out in the first fleet as surgeon's first mate on the *Sirius* and subsequently became Principal Surgeon in New South Wales. While surgeon in the Navy in the Baltic in 1807, Sir John was decorated with the Order of Gustavus Vasa by King Charles of Sweden, according to one account for aid rendered during an outbreak of cholera in the Swedish army. Another account assigns the honour to his successful treatment of an attack of mastitis in the Queen. The Prince Regent

permitted Jamison to retain this order in the British Empire with the title of "Sir". Jamison came to Sydney in 1814 and resided at his father's property, "Regentville" (near Penrith), which was one of the most imposing mansions of the period. Jamison did not seriously devote himself to his profession in New South Wales, but was one of the most outstanding personalities of the time as an agriculturist and pastoralist. On his property Sir Henry Parkes worked as a labourer in the vineyard, and one Bent was another labourer whose son, Thomas Bent, was born on the property and subsequently became Sir Thomas Bent, Premier of Victoria. Jamison's assigned convict servants discovered at Regentville a nettle with remarkable stinging powers. This plant they used to produce on themselves, when tired of work, an acute inflammation of the hands, thus gaining a temporary respite from labour. Jamison was keenly interested in the flora and fauna of this country. He sent black swans to Queen Victoria. These have been said to have been the first seen in Europe. Writing in 1816, Jamison described the serious effects resulting from wounds inflicted by the perforated spur of the male platypus. He also reported that the female laid eggs.

Governor Macquarie named Jamison's Valley, in the Blue Mountains, and Jamison's Valley Creek after Sir John. The spelling, however, has since been incorrectly altered to Jamieson. Similarly with Jamieson Street in Sydney. There is a small area on the site of his old residence, near Penrith, called Jamison Town. It is said, too, that County Jamison, in north-eastern New South Wales, derives its name from Sir John. Jamison had property near Capertee, and an opening of the Capertee Valley has been called "Sir John's Mouth".

Yours, etc.,

175, Macquarie Street, Sydney,
May 24, 1934.

JOHN MACPHERSON.

Diary for the Month.

JUNE 12.—Tasmanian Branch, B.M.A.: Branch.
JUNE 12.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 19.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 19.—Tasmanian Branch, B.M.A.: Council.
JUNE 20.—Western Australian Branch, B.M.A.: Branch.
JUNE 21.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 22.—Queensland Branch, B.M.A.: Council.
JUNE 26.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JUNE 27.—Victorian Branch, B.M.A.: Council.
JUNE 28.—South Australian Branch, B.M.A.: Branch.
JUNE 28.—New South Wales Branch, B.M.A.: Branch.

Medical Appointments.

Dr. B. G. Johnston (B.M.A.) has been appointed a Member of the Medical Board, Port Pirie, South Australia, under the provisions of the *Workmen's Compensation Act*, 1932.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages XX, XXI, XXII.

ANTI-TUBERCULOSIS ASSOCIATION OF NEW SOUTH WALES: Honorary Medical Officer.

AUSTIN HOSPITAL FOR CANCER AND CHRONIC DISEASES, HEIDELBERG, VICTORIA: Resident Medical Officer.

MATER MISERICORDIÆ CHILDREN'S HOSPITAL, BRISBANE, QUEENSLAND: Resident Medical Officer.

SAINT VINCENT'S HOSPITAL, MELBOURNE, VICTORIA: Honorary Officer.

SAINT VINCENT'S HOSPITAL, SYDNEY, NEW SOUTH WALES: Medical Officers.

THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing. Lower Burdekin District Hospital, Ayr
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	Combined Friendly Societies, Clarendon and Kangarilla districts. Officer of Health, District Council of Elliston. All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

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